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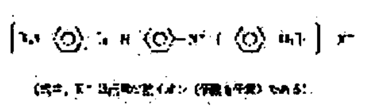
(54) COLOR TONER FOR FLASH FIXING AND ITS PRODUCTION

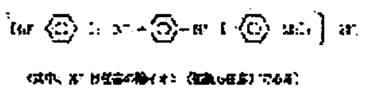
(57)Abstract:

PURPOSE: To obtain sufficient tone, electrifying characteristic and flash fixing property of a color toner for flash fixing by physically or chemically preventing, suppressing or compensating the reaction between an IR absorbent and a positive charge controlling agent.

CONSTITUTION: The toner contains a binder resin, IR absorbent of aluminum salt compd. expressed by formula I and/or formula II, coloring agent, positive charge controlling agent. As for the binder resin, a mixture of several kinds of resins is used. The IR absorbent is selectively dispersed or dissolved in a specified resin among these resins to suppress the reaction between the IR absorbent and the positive charge controlling agent. Or, by using a compd. expressed by formula III for the IR absorbent, and further by mixing the compd. with one or more kinds of specified compds., decrease in the absorptivity and the charge controlling performance due to the reaction of the IR absorbent and the positive



I



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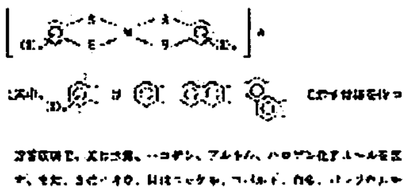

charge controlling agent can be compensated.

LEGAL STATUS

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[Date of requesting appeal against examiner's decision of rejection]	01.04.1999
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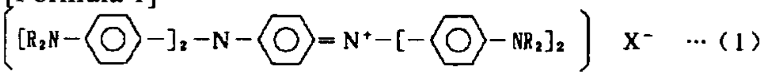
CLAIMS

[Claim(s)]

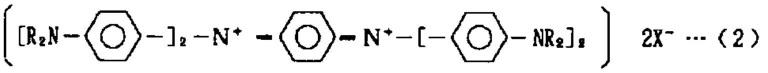
[Claim 1] a binder resin and the following general formula (1) -- and/or (2) --

[Formula 1]



… (1)

（式中、X^- は任意の陰イオン（価数も任意）である）



… (2)

（式中、X^- は任意の陰イオン（価数も任意）である）

The infrared light absorbent, the coloring material, the straight polarity electrification control agent or/, and the straight polarity electrification control resin of the aminium salt system compound come out of and expressed (In accordance with a straight polarity electrification control agent and a straight polarity electrification control resin, it is hereafter called a straight polarity electrification control agent.) [whether it comes to contain and the reaction of an infrared light absorbent and a straight polarity electrification control agent is suppressed by one means of following (i) - (vi), and] or the optical-absorption ability and electrification control ability which are reduced by the reaction of an infrared light absorbent and a straight polarity electrification control agent -- the following (vii) -- or (viii) the color toner for flash plate fixing characterized by complementing by the means

(i) The mixture of two or more sorts of resins is used as a binder resin, and an infrared light absorbent is alternatively distributed or fused in the specific resin of the one section among those.

(ii) The binder resin which contains a straight polarity electrification control agent and/or a straight polarity electrification control agent in the periphery section of the toner which comes to contain an infrared light absorbent, a coloring material, and a binder resin is covered, or it is made to adhere as a particle.

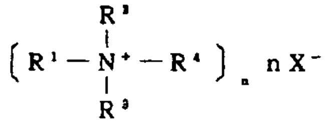
(iii) The binder resin which contains an infrared light absorbent and/or an infrared light absorbent in the periphery section of the toner which comes to contain a coloring material and a straight polarity electrification control agent is covered, or it is made to adhere as a particle.

(iv) A ** amine system functional-group resin and/or quarternary ammonium salt are blocked with the resin containing an acid functional group as a binder resin using the mixture of the ** amine system functional-group resin containing the functional group of secondary amine, tertiary amine, and/or the 4th class amine and/or quarternary ammonium salt, and the resin containing an acid functional group.

(v) One or more sorts in the thermoplastics which has an amide group and/or the pendant machine of a nitrogen ring, an amide compound, polyamide resin, amine denaturation polyester resin, urethane denaturation polyester resin, and the amine denaturation epoxy resin that constructed the bridge by the diamine are used as a binder resin.

(vi) It is a general formula (3) as a straight polarity electrification control agent.

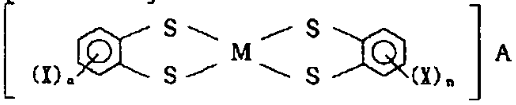
[Formula 2]



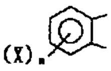
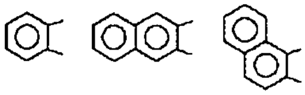
$$\left[R^1 - \overset{R^2}{\underset{R^3}{N^+}} - R^4 \right]_n nX^- \qquad \cdots (3)$$

（式中、R^1～R^4 は任意のアルキル基、フェニル基又はその誘導体であり、X^- は一般式（1），（2）と同一の陰イオンである。）

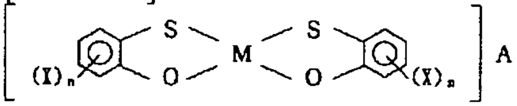
It comes out and the quarternary ammonium salt expressed is used.
(vii) As an infrared light absorbent, the compound expressed with a general formula (1) and the compound expressed with a general formula (2) are used together, and it is anion X. - Two or more sorts of compounds which carry out in common or are expressed with a general formula (1) are used.
(viii) As an infrared light absorbent, it mixes further and one or more sorts in the compound expressed with general formula (4) - (8) are used.
[Formula 3]



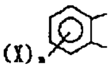
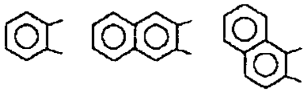
… (4)

（式中、 は  で示す骨格を持つ芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。また、Sはイオウ、Mはニッケル、コバルト、白金、パラジウムをAは4級アンモニウム塩を表す。）

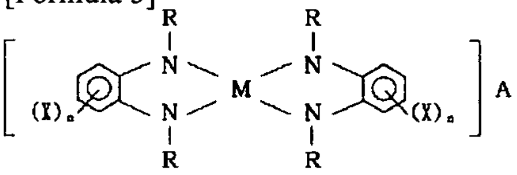
[Formula 4]



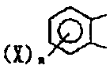
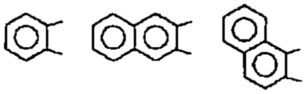
… (5)

（式中、 は  で示す骨格を持つ芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。また、Sはイオウ、Oは酸素、Mはニッケル、コバルト、白金、パラジウムを、Aは4級アンモニウム塩を表す。）

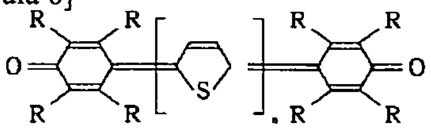
[Formula 5]



… (6)

（式中、 は  で示す骨格を持つ芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。また、Rは水素、アルキル、ハロゲン化アルキルを、Nは窒素、Mはニッケル、コバルト、白金、パラジウムを、Aは4級アンモニウム塩を表す。）

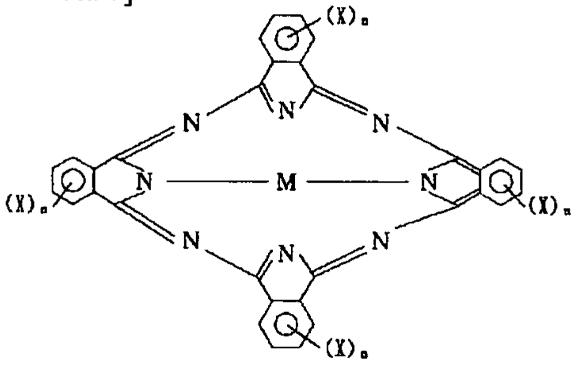
[Formula 6]



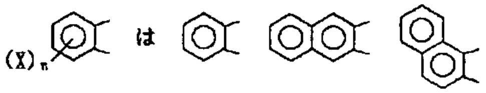
… (7)

（式中、Rは水素、炭素数1～4のアルキル、ハロゲン化アルキルを、
Oは酸素、Sはイオウを表す。またnは正整数である。）

[Formula 7]



… (8)

（式中、で示す骨格を持つ
芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。Nは窒素、Mは2価の金属原子、3～4価の置換金属原子もしくは2個の水素原子を表わす。）

[Claim 2] The toner according to claim 1 which distributes or fuses alternatively an infrared light absorbent and a straight polarity electrification control agent to a binder resin different, respectively when the aforementioned means (i) is adopted.

[Claim 3] The toner according to claim 2 from which it is separated of the solubility parameter of the binder resin which distributed or fused the infrared light absorbent, and the binder resin which distributed or fused the straight polarity electrification control agent 0.5 or more.

[Claim 4] A toner given in any 1 term of the claims 1-3 whose straight polarity electrification control agents are the ** amine system functional-group resins which contain a gel component at quarternary ammonium salt or 200 degrees C or more of melting points.

[Claim 5] The toner according to claim 1 whose ** amine system functional-group resins the resin containing an acid functional group is polyester resin which has a carboxylic acid and/or a sulfonic acid when the aforementioned means (iv) is adopted, and are styrene and the copolymer of amino acrylate.

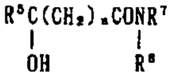
[Claim 6] The toner according to claim 1 whose common anion of the compound expressed with a general formula (1) and/or (2) when the aforementioned means (vi) is adopted, and the compound expressed with a general formula (3) is either of perchloric acid ion, boron-fluoride acid ion, hexafluoro arsenic acid ion, hexafluoro antimonic-acid ion, and the sulfonic-acid ion that are expressed with RSO3- (the inside of a formula and R are a four or less-carbon number alkyl group, a fluoro alkyl group, or a phenyl group).

[Claim 7] The toner according to claim 1 or 6 which uses together another quarternary ammonium salt which has the anion of quarternary ammonium salt expressed with a general formula (3), and a different anion.

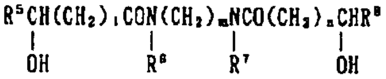
[Claim 8] The toner according to claim 1 whose anion of the aminium salt system compound of a general formula (1) is perchloric acid ion when adopting the aforementioned means (vii).

[Claim 9] General formula (9) Toner for flash plate fixing characterized by making the amide compound particle expressed with - (11) adhere to a toner front face.

[Formula 8]

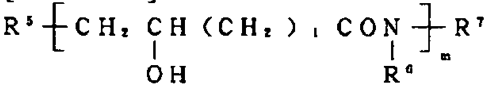


$R^5\underset{\mathrm{OH}}{C}(CH_2)_nCO\underset{R^8}{N}R^7$ … (9)



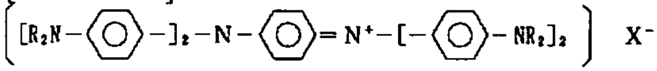
$R^5\underset{\mathrm{OH}}{CH}(CH_2)_lCO\underset{R^6}{N}(CH_2)_m\underset{R^7}{N}CO(CH_2)_n\underset{\mathrm{OH}}{CH}R^8$ … (10)

As for l, m, and n, the integer of 0-4 and R5 -R8 are hydrogen, an alkyl group, a halogenation alkyl group, an aryl group, or a halogenation aryl group among [a formula (9) and (10).]
[Formula 9]



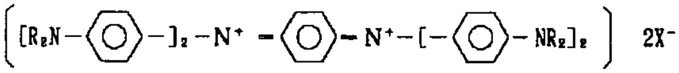
$R^5\left[CH_2\underset{\mathrm{OH}}{CH}(CH_2)_lCO\underset{R^6}{N}\right]_mR^7$ … (11)

Among [formula (11), l and m are a positive integer and R5 -R7 is the same as the above-mentioned definition.]
[Claim 10] a general formula (1) -- and/or (2) --
[Formula 10]



… (1)

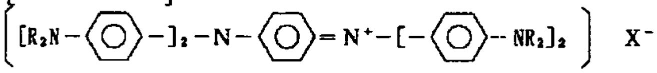
（式中、X^- は任意の陰イオン（価数も任意）である）



… (2)

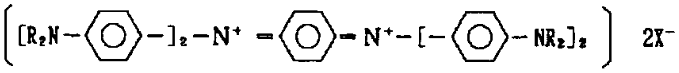
（式中、X^- は任意の陰イオン（価数も任意）である）

The manufacture method of the color toner for flash plate fixing which prepares the 1st binder resin which came out, and distributed or fused the aminium salt system compound expressed, and the 2nd different binder resin from the 1st binder resin which distributed or fused the straight-polarity electrification control agent, and kneads these [1st] and the 2nd binder resin, and is characterized by to include the process which is pulverized and is made into a toner.
[Claim 11] a general formula (1) -- and/or (2) --
[Formula 11]



… (1)

（式中、X^- は任意の陰イオン（価数も任意）である）



… (2)

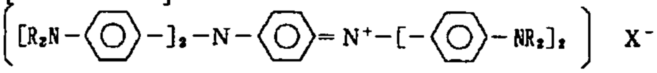
（式中、X^- は任意の陰イオン（価数も任意）である）

The manufacture method of the color toner for flash plate fixing characterized by including the process which is made to condense and fix the 2nd impalpable powder of the ** amine system functional-group resin characterized by providing the following, and/or quarternary ammonium salt several 10 - 10,000 numbers in the liquid phase, and obtains a toner. The 1st impalpable powder of the 1st binder resin which came out, and distributed or fused the aminium salt system compound expressed. The functional group of the 2nd binder resin which distributed or fused a straight polarity electrification control agent or/, and the straight polarity electrification control resin (henceforth a straight polarity electrification control agent in accordance with a straight polarity electrification control agent and a straight polarity electrification control resin), secondary amine, tertiary amine, and/or the 4th class amine.
[Claim 12] The method according to claim 11 of heating the liquid phase to the temperature which the 1st and 2nd impalpable powders do not fuse, but the 3rd impalpable powder fuses after making the 3rd tens of thousands of number

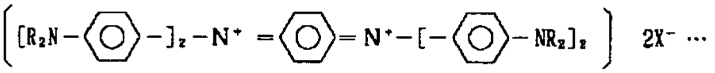
10- impalpable powders of the low thermoplastics of melting temperature condense in the liquid phase from the 1st and 2nd impalpable powders with the 1st impalpable powder and the 2nd impalpable powder, and making it fix impalpable powders.

[Claim 13] a general formula (1) -- and/or (2) --

[Formula 12]


··· (1)

（式中、X^- は任意の陰イオン（価数も任意）である）


··· (2)

（式中、X^- は任意の陰イオン（価数も任意）である）

The manufacture method of the color toner for flash plate fixing characterized by including the process which film-izes the 2nd binder resin on a toner front face by the mechanofusion method after carrying out electrostatic adhesion of the particle of the 2nd binder resin which contains a straight polarity electrification control agent in the periphery section of the toner which comes out and comes to contain the infrared light absorbent, the coloring material, and the 1st binder resin which are expressed.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] In a xerography etc., this invention relates to the color toner for flash plate fixing used in order to visualize an electrostatic latent image, and its manufacture method, and relates to the color toner for flash plate fixing which made controllable the triboelectrification property of the toner which contains the near-infrared optical-absorption agent of an aminium salt compound system as an indispensable constituent in more detail, and its manufacture method.
[0002]
[Description of the Prior Art] Development visualization is carried out using the impalpable powder which forms an electrostatic latent image by this using a photoconductivity insulator (photograph contest drum etc.) generally although the method indicated by U.S. Pat. No. 2297691 etc. as the former and a xerography is common knowledge, and giving electrostatic charge uniform on this photoconductivity insulator by corona discharge etc., and irradiating a light figure on this photoconductivity insulator by various meanses, and is subsequently called toner in this latent image.
[0003] And after imprinting a toner picture on record media, such as paper, if needed, you carry out melting of this toner picture by pressurization, heating, the solvent steam, light, etc., and make it established on this record medium, and printed matter is obtained. If a coloring agent and the need are accepted into the binder resin which consists of nature or synthetic-macromolecule matter conventionally as a toner which develops these electrostatic latent images, the particle which pulverized what distributed additives, such as an electrification control agent, to about 1-30 micrometers is used.
[0004] By the electrophotography 2 component developing-negatives method, usually, it is mixed with support matter (carrier), such as ferromagnetics, such as iron powder, and a glass bead, and this toner is used for the development of an electrostatic latent image. In the case of the magnetic brush developing-negatives method using ferromagnetic particles, such as iron powder or a ferrite, as a carrier Triboelectrification of the developer which consists of a toner and a carrier is carried out by carrying out mixed stirring within a developer. Furthermore, it is held with the magnet roll in a developer, and a magnetic brush is formed, and a magnetic brush is carried by the latent-image portion on a photoconductivity insulator, and when this magnet roll rotates, development is performed when only the electrified toner adheres to a latent image with an electric suction force.
[0005] Here, since it is necessary to fuse quickly the binder resin which constitutes a toner in process of fixing to a record medium and good fixing nature needs to be shown, the macromolecule resin generally [the low low molecular weight of melt viscosity] called oligomer is used widely. On the other hand, the aforementioned fixing carries out melting of the toner on record space by pressurization, heating, the solvent steam, light, etc., and although it is fixing on the recording paper, the optical fixing method of having the following properties among these fixing methods attracts attention.
[0006] (1) Since it is non-contact fixing, don't degrade the resolution of a picture in fixing process.
(2) There is no latency time behind equipment powering on, and the quick start is possible.
(3) Even if it gets the recording paper blocked in a fixing assembly by the system down, don't ignite.
(4) It gets, and it is attached and can be established regardless of the quality of the material and thickness of the recording papers, such as paper, a preprinted sheet, and paper in which thickness differs.
[0007] In addition, it is the flash plate establishing method which uses xenon flash plate light as the light source as common practice most as an optical establishing method now. By the optical fixing methods that the luminescence intensity of the wavelength of an infrared region uses the strong light source, such as the xenon flash plate establishing method, the optical-absorption ability of a toner is raised and the technique of adding the infrared light absorbent of AMMONIUMIRU compounds, such as an aminium salt system compound, in a toner is indicated by JP,61-132959,A

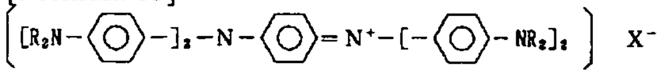
etc. as a device which extends the use range of the optical establishing method for having the aforementioned advantage.

[0008]

[Problem(s) to be Solved by the Invention] In the light field, an aminium salt system compound has few degrees of influence to the color tone of toner original, and although the high compound of infrared light absorbing power has many which have the hue of brown shell black, since there is a compound in which a light color tone is shown, in order to compensate the optical-absorption ability of a color toner, let it be a very useful compound, while it shows the outstanding infrared light absorbing power.

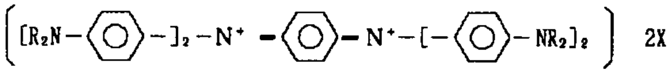
[0009] However, this aminium salt system compound is [0010].

[Formula 13]



··· (1)

(式中、X⁻ は任意の陰イオン（価数も任意）である)



··· (2)

(式中、X⁻ は任意の陰イオン（価数も任意）である)

[0011] ** -- like, since it is the quality of the salt structure which has a counter ion, if there are polar parts (for example, tertiary amine, such as dimethylaminoethyl methacrylate etc.) strong in a toner and reactant high ionicity compounds (for example, quarternary ammonium salt etc.), the counter ion of an aminium salt system compound will receive drawing by the polar group, or counter ion exchange reaction will arise between ionicity compounds

[0012] Therefore, since a structural change of this aminium salt system compound arises, the optical-absorption band of this aminium salt system compound shifts, and in being remarkable, there is a problem which loses completely the optical-absorption ability to the wavelength of a flash plate light field. On the other hand, the aforementioned quarternary ammonium salt has the electrification control ability which was excellent as a colorless straight polarity electrification control agent, and is regularly used with the color toner. Moreover, although whether amine system compounds other than quarternary ammonium salt are added to a toner or an amine system functional group's being introduced into a binder resin, and a method are taken as the technique of giving plus electrification nature to a toner, without using quarternary ammonium salt, these amines system compound also has high possibility of causing a structural change of the aforementioned aminium salt system compound, as mentioned above.

[0013] The plus electrification nature color toner which cannot use together the aminium salt system compound which raises the optical-absorption ability of a color toner, and amine system compounds (it is hereafter called an electrification control agent), such as quarternary ammonium salt which gives electrification control ability, but is excellent in optical-absorption ability, and shows good optical fixing nature from the above thing is inferior to an electrification property, and the problem that where of it is inferior in optical fixing nature is in the plus electrification nature color toner which is excellent in an electrification property.

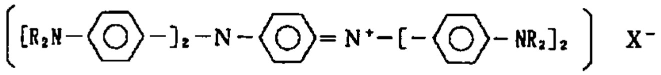
[0014] this invention having been made in view of the above actual condition, and making an aminium salt system compound and an electrification control agent live together in a toner, it stops a structural change of an aminium salt system compound to the minimum, and aims at offer of the toner for flash plate fixing which the flash plate fixing nature and the electrification property of a toner were combined [toner], and reconciled them, and its manufacture method.

[0015]

[Means for Solving the Problem] in order to attain the above-mentioned purpose -- this invention -- a binder resin and the following general formula (1) -- and/or (2) --

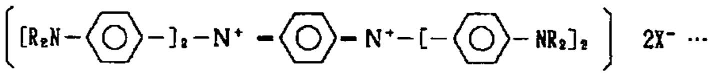
[0016]

[Formula 14]



… (1)

（式中、X^- は任意の陰イオン（価数も任意）である）



… (2)

（式中、X^- は任意の陰イオン（価数も任意）である）

[0017] Come out and it comes to contain the infrared light absorbent of the aminium salt system compound expressed, a coloring material, and a straight polarity electrification control agent. An infrared light absorbent, a straight polarity electrification control agent or/, and a straight polarity electrification control resin (in accordance with a straight polarity electrification control agent and a straight polarity electrification control agent, it is also only hereafter called a straight polarity control agent.) It is a reaction Following (i) - (Vi) [whether it suppresses by one of meanses, and] or the optical-absorption ability and electrification control ability which are reduced by the reaction of an infrared light absorbent and a straight polarity electrification control agent -- the following (vii) -- or (viii) offers the color toner for flash plate fixing characterized by complementing with a means

[0018] (i) The mixture of two or more sorts of resins is used as a binder resin, and an infrared light absorbent is alternatively distributed or fused in the specific resin of the one section among those.

(ii) The binder resin which contains a straight polarity electrification control agent and/or a straight polarity electrification control agent in the periphery section of the toner which comes to contain an infrared light absorbent, a coloring material, and a binder resin is covered, or it is made to adhere as a particle.

[0019] (iii) The binder resin which contains an infrared light absorbent and/or an infrared light absorbent in the periphery section of the toner which comes to contain a coloring material and a straight polarity electrification control agent is covered, or it is made to adhere as a particle.

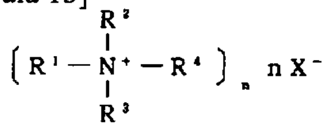
(iv) A ** amine system functional-group resin and/or quarternary ammonium salt are blocked with the resin containing an acid functional group as a binder resin using the mixture of the resin containing the ** amine system functional-group resin containing the functional group of secondary amine, tertiary amine, and/or the 4th class amine and/or quarternary ammonium salt, and an acid functional group.

[0020] (v) One or more sorts in the thermoplastics which has an amide group and/or the pendant machine of a nitrogen ring, an amide compound, polyamide resin, amine denaturation polyester resin, urethane denaturation polyester resin, and the amine denaturation epoxy resin that constructed the bridge by the diamine are used as a binder resin.

(vi) It is a general formula (3) as a straight polarity electrification control agent.

[0021]

[Formula 15]



$$\left[R^1-\overset{R^2}{\underset{R^3}{N^+}}-R^4\right]_n nX^- \quad \cdots (3)$$

（式中、R^1 ～R^4 は任意のアルキル基、フェニル基又はその誘導体であり、X^- は一般式（１），（２）と同一の陰イオンである。）

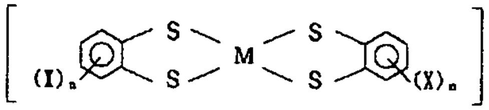
[0022] It comes out and the quarternary ammonium salt expressed is used.

(vii) As an infrared light absorbent, the compound expressed with a general formula (1) and the compound expressed with a general formula (2) are used together, and it is anion X. - Two or more sorts of compounds which carry out in common or are expressed with a general formula (1) are used.

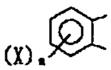
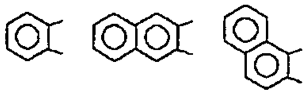
(viii) As an infrared light absorbent, it mixes further and one or more sorts in the compound expressed with general formula (4) - (8) are used.

[0023]

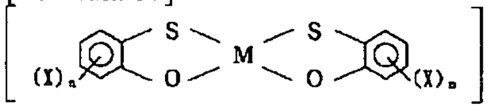
[Formula 16]



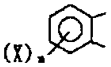
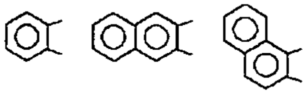
…（4）

（式中、 は  で示す骨格を持つ芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。また、Sはイオウ、Mはニッケル、コバルト、白金、パラジウムをAは4級アンモニウム塩を表す。）

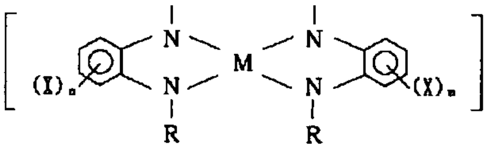
[0024]
[Formula 17]



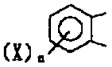
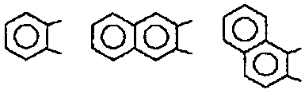
…（5）

（式中、 は  で示す骨格を持つ芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。また、Sはイオウ、Oは酸素、Mはニッケル、コバルト、白金、パラジウムを、Aは4級アンモニウム塩を表す。）

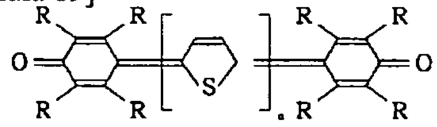
[0025]
[Formula 18]



…（6）

（式中、 は  で示す骨格を持つ芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。また、Rは水素、アルキル、ハロゲン化アルキルを、Nは窒素、Mはニッケル、コバルト、白金、パラジウムを、Aは4級アンモニウム塩を表す。）

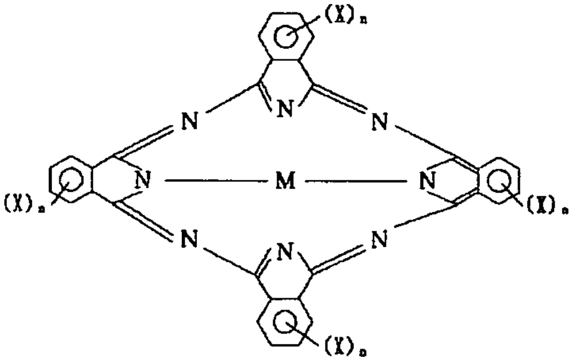
[0026]
[Formula 19]



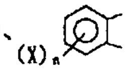
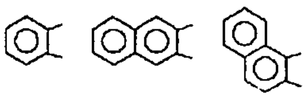
…（7）

（式中、Rは水素、炭素数1～4のアルキル、ハロゲン化アルキルを、Oは酸素、Sはイオウを表す。またnは正整数である。）

[0027]
[Formula 20]



… (8)

（式中、はで示す骨格を持つ芳香族環で、Xは水素、ハロゲン、アルキル、ハロゲン化アルキルを表す。Nは窒素、Mは2価の金属原子、3～4価の置換金属原子もしくは2個の水素原子を表わす。）

[0028] Hereafter, it explains concretely. The toner of this invention starts the color toner for flash plate fixing, and, for the reason, contains a coloring material, an infrared light absorbent, and a straight polarity electrification control agent in a binder resin. although the thermoplastics which is not limited especially as a binder resin but consists of various kinds of nature or synthetic-macromolecule matter can be used, about 5000 to 100,000 weight average molecular weight, the epoxy resin of 90-140 degrees C of melting points, styrene-acrylic resin, polyamide resin, polyester resin, a polyvinyl resin, a polyurethane resin, a polybutadiene resin, etc. are typically independent -- or it is mixed and used

[0029] Especially a coloring material (coloring agent) is not limited, either, but any, such as a color and a pigment, are sufficient, for example, a Quinacridone (red), phthalocyanines (blue etc.), an ANSURA quinone (red), screw azo (red or yellow), monoazo (red), an ANIRAIDO system compound (yellow), a benzidine (yellow), a halogenation phthalocyanine (green), etc. are used. As an infrared light absorbent, the aminium salt system compound expressed with a general formula (1) and (2) is used. The absorptance of an infrared light field is high, and since the color in a light field is light, these aminium salt system compounds have few operations which pollute the color tone of a toner, and they are suitable for them as an object for color toners. You may use together infrared light absorbents other than the aminium salt system compound expressed with a general formula (1) and (2). Although black stain pigments, such as carbon black, have high infrared light absorptance, the degree of black is strong, and since the color tone of a toner is soiled, it cannot be used for a color toner.

[0030] It sets to a general formula (1) and (2), and is anion X. - If it carries out, perchloric acid (CClO4-), A boron-fluoride acid (BF4-), trichloroacetic acid (CCl3 COO-), A trifluoroacetic acid (CF3 COO-) and a picric acid (NO2) (3 C6 H2 O-), A hexafluoro arsenic acid (AsF6-) and a hexafluoro antimonic acid (SbF6-), A benzenesulfonic acid (C6 H5 SO3-), an ethane sulfonic acid (C2H5 SO3-), phosphoric acid (PO42-), a sulfuric acid (SO4-), and chlorine (Cl-) Each ion is typical.

[0031] Although it will not be restricted especially if a straight polarity electrification control agent also has the capacity to just electrify a toner by stirring of a developer, quarternary ammonium salt (colorlessness), a Nigrosine color (black), a triphenylmethane-color derivative (blue), etc. are used suitably. In addition, a later compound and a resin can also be used as a straight polarity electrification control agent. Moreover, in order to adjust an electrification controllability, a negative polarity electrification control agent like a NAFUTOYA acid zinc complex (colorlessness) and a salicylic-acid zinc complex (colorlessness) can be used together.

[0032] Although various additives can be added in addition to this, especially waxes and surfactants (for example, polypropylene wax etc.) (for example, silicone varnish etc.) can be mentioned to the color toner for flash plate fixing. Although the mean particle diameter of a toner is generally about 1-30 micrometers, it is not necessarily limited especially.

[0033] such [this invention] a color toner for flash plate fixing -- setting -- an aminium salt system infrared light absorbent -- especially -- a straight polarity electrification control agent -- reacting -- infrared light absorptivity ability -- a fall -- or -- ****** -- things are characterized by prevention or suppressing or complementing with the following means

[0034] The scarce binder resin 1-1 of compatibility and 1-2 are mixed and used as a binder resin, and the specific binder resin 1-1 of them is made to distribute or fuse alternatively the aminium salt system infrared light absorbent 2, as typically shown in means (i) drawing_1 . especially -- already -- the binder resin 1-2 of the method of one -- the straight polarity electrification control agent 3 -- alternative -- distribution -- or melting is carried out

[0035] Two or more binder resins 1-1 and 1-2 are made to take the so-called "sea island structure." the infrared light absorbent 2 is alternatively existed in the specific binder resin 1-1 (or 1-2) -- making -- more -- desirable -- the straight polarity electrification control agent 3 -- already -- the binder resin 1-2 (or by making it exist in 1-1 alternatively) of the method of one When the opportunity of contact to the infrared light absorbent 2 and the straight polarity electrification control agent 3 was reduced, these mutual reactions were able to be prevented or suppressed. It became possible to be compatible in fixing nature and an electrification property in the color toner for flash plate fixing with this.

[0036] Although the function will be lost if an aminium salt system compound is random-**(ed) in a counter ion as mentioned above, the matter which triggers such a reaction is the quarternary ammonium salt currently used abundantly as an electrification control agent for plus electrification toners, a ** amine system functional-group resin, etc. According to this invention person's etc. examination, it is also possible to make this resin itself into "the so-called sea" or so-called "island", considering as the resin (** amine system functional-group resin) which has the strong electrification property that it has an amine compound for one or more sorts of binders of two or more sorts of binders used for a toner in a molecule skeleton, and giving the function as a straight polarity electrification control agent to this resin.

[0037] For example, the melting point can use a resin 200 degrees C or more by the gel resin of a ** amine system functional-group resin as a straight polarity electrification control agent. The reason with more desirable the melting point using a gel resin 200 degrees C or more is because a reaction with the aminium [direction / which chose what is not softened at general toner kneading temperature] salt system compound at the time of toner manufacture is suppressed.

[0038] The solubility parameter with distribution or the binder resin 1-2 which carries out melting needs to get used desirably distribution or the binder resin 1-1 which carries out melting, and the straight polarity electrification control agent 3 one or more 0.5 or more in the aminium salt system compound 2. If each binder resin 1-2 and the compatibility of 1-1 are high, since both the binder resin will be mixed homogeneously, without taking "sea island structure", this is because the purpose of the increase of an opportunity which the aminium salt system compound 2 and the straight polarity electrification control agent 3 approach, and this invention becomes is hard to be attained.

[0039] In addition, the combination of the thermoplastics which fulfills these conditions according to this invention person's etc. examination Polyester resin, an epoxy resin, polyester resin and styrene-acrylic resin, Polyester resin, polyamide resin and polyester resin, and styrene-butadiene resins, An epoxy resin, styrene-acrylic resin and an epoxy resin, and polyamide resin, By busy ****, such as an epoxy resin, styrene-butadiene resins, polyamide resin, styrene-acrylic resin and polyamide resin, styrene-butadiene resins, and a styrene-acrylic, styrene-butadiene resins It has found out satisfying many properties which fulfill the difference of such a degree parameter of melting, and are needed for the binder for flash plate fixing.

[0040] In addition, according to this invention person's etc. examination, it is the combination with polyester resin, styrene-acrylic resin, styrene-butadiene resins and styrene, acrylate, the copolymerization resin of a butadiene, etc. which has the best property in the above-mentioned combination. It is because it is easy to attain by using combination with the above-mentioned polyester resin, styrene-acrylic resin, styrene-butadiene resins and styrene, acrylate, the copolymerization resin of a butadiene, etc. for melting viscoelastic property required in order to maintain good fixing nature, preventing the "void phenomenon" in which a toner particle carries out melting condensation and which is generated in the case of flash plate fixing about which it argues by JP,4-56869,A etc., although this differs from the theme of this invention.

[0041] Moreover, according to this invention person's etc. examination, as a binder resin which distributes an aminium salt system compound, a polyester system resin is more desirable. It is for performing the salt abstraction reaction of an aminium salt system compound depending on the monomer kind which constitutes a binder resin, although the degree is light compared with an amine system compound even if this is a resin which does not contain the above amine compounds.

[0042] Although such an example is occasionally seen when styrene-acrylic resin etc. is used as a binder, for example, the reaction with an aminium salt system compound is not seen in a styrene-n butyl acrylate copolymer, a result, like a quite strong salt abstraction reaction arises is obtained by examination of this invention persons by the styrene-2-ethylhexyl acrylate copolymer.

[0043] On the other hand, although the polyester system resin changed monomer kinds, such as a diol and a dicarboxylic acid, and monomer percentage, manufactured various binder resins and investigated the reactivity, there was what [no] reacts with an aminium salt system compound except for the case where some nitrogen-containing monomers are used. Therefore, it is more desirable to distribute an aminium salt system compound to a polyester side as two kinds of resins with which solubility parameters differ, when choosing polyester and two kinds of resins of a styrene-acrylic, and to distribute an electrification control agent to a styrene-acrylic side.

[0044] In addition, according to this invention person's etc. experience, the resin which distributes an electrification control agent has a desirable resin with more high melt viscosity. This is because the desired electrification control effect is acquired in many cases by addition of an electrification [made / more nearly little / for the high resin of melt viscosity to distribute an electrification control agent] control agent. As a high resin of such melt viscosity, polyfunctional acids, such as trimellitic acid and a pentaerythritol, the constructed type polyester system resin of a bridge which makes polyfunctional alcohol an indispensable composition monomer, the constructed type styrene [of a bridge]-acrylic resin which makes a divinylbenzene etc. an indispensable composition monomer are known.

[0045] According to this invention person's etc. knowledge, based on each above demand, as composition which fulfills the meaning of this invention Adding an aminium salt system compound to a polyester system resin or a polyamide system resin as a resin which it is [resin] more desirable and, on the other hand, makes a straight polarity electrification control agent distribute A book since the resin with which this polyester resin and polyamide resin differ from a solubility parameter greatly is required It is more desirable to have bridge formation etc. and to use the styrene-acrylic resin and styrene-butadiene system resin in which the property of a hyperviscous resin is shown a little.

[0046] In addition, although it is the practice of this invention, it is necessary to make arbitrary kinds of two or more sorts of binder resins which have a difference in the degree parameter of melting distribute a straight polarity electrification control agent for an aminium salt system compound to another binder resin first. In addition, after manufacturing the method and binder resin which distribute a ** agent among these at the time of the polymerization of a binder resin as the technique of making these binder resins distribute inner ** agents, such as an aminium salt system compound and a straight polarity electrification control agent, even if there is a method of distributing an inner ** agent by kneading etc. and it uses which method, it is possible to carry out this invention.

[0047] In addition, although it is more advantageous to distribute an inner ** agent from the distributed efficiency and the manufacturing-cost side of an inner ** agent at the time of a resin polymerization by the method of distributing an inner ** agent at the time of a resin polymerization, and the technique of distributing an inner ** agent by kneading The quarternary ammonium salt regularly used as an aminium salt system compound or an electrification control agent is lacking in thermal resistance, and since property change arises at the temperature of less than 200 degrees C, the problem that the binder resin system for toners will be limited is included.

[0048] Subsequently, although toner-ized combining the binder resin containing the inner ** agent which are these indispensable constituents, as this method, two methods, the method of performing by kneading and pulverization and the method of performing by condensation and heating in the liquid phase, can be taken. Although one is the method of toner-izing by kneading and pulverization, it can mix inner ** agents, such as a coloring material and a wax, the binder resin containing the aminium salt system compound, the binder resin containing the straight polarity electrification control agent, and if needed, and can obtain a desired toner by performing pulverization and a classification for the above-mentioned material after melting kneading using grinders, such as a jet mill, using a kneader, an extruder, etc. For example, melting or the distributed resin impalpable powder can be obtained for an aminium salt system compound after that by kneading performing the aforementioned distribution using a ROTOPU Rex grinder using the polyester resin which makes main diols a major component and the bisphenol A alkylene oxide addition product for a terephthalic acid by using an aminium salt system compound as distribution or the resin which carries out melting by obtaining a pellet-like pulverization object with a particle size of about 1-5mm.

[0049] However, the binder resin which distributed the aminium salt system compound in the case of kneading, When degree of dispersion of the resins which distributed the straight polarity electrification control agent is too low, in the toner particle after pulverization / classification If the toner which consists of only one resinous principles comes to exist, kneading intensity is conversely [preferably and] strong and both resin right-distributes Since the ratio of the so-called "sea", the aminium salt system compound which reacts by the interface of an "island", and a straight polarity electrification control agent becomes large and it becomes impossible for a toner to be compatible in desired optical-absorption ability and desired electrification control ability, it is not desirable.

[0050] For this reason, when based on this invention person's etc. experience, it is desirable to perform comparatively loose kneading on the occasion of kneading of both binder resin. Moreover, when the distributed state of other inner ** agents, such as a coloring material and a wax, does not reach a desired state and a binder resin is made to distribute a straight polarity electrification control agent or an aminium salt system compound by such loose kneading, it is also possible to distribute other inner ** agents, such as a coloring material and a wax.

[0051] On the other hand, the method of toner-izing by condensation and heating in the liquid phase Distribution or the resin impalpable powder (the resin impalpable powder which has an electrification controllability is also good) which carried out melting is distributed [an aminium salt system compound] for distribution or the resin impalpable powder which carried out melting, and a straight polarity electrification control agent in the liquid phase. It toner-izes by making this resin powder condense, carrying out liquation of this resin powder floc by heating further, and making it fix by the means of controlling the electrification property in the inside of the liquid phase of a resin impalpable powder. For example, with the impalpable powder of distribution or the binder resin which carried out melting, the impalpable powder of distribution or the binder resin which carried out melting, and/or the impalpable powder of the thermoplastics of a ** amine system functional-group resin can be beforehand made [an aminium salt system compound] into an indispensable constituent for a straight polarity electrification control agent, several 10- tens of thousands particle condensation and fixing of the thermoplastics impalpable powder containing this resin impalpable powder can be done into the liquid phase, and a toner can be obtained.

[0052] In addition, since the "sea", and the "island" which are the theme of this invention are clearly formed compared with the toner by the aforementioned method of kneading / grinding, although the toner by this method is the manufacture method which was most suitable for carrying out this invention, there is how the trouble for attaining utilization of this manufacture method obtains the detailed resin impalpable powder (primary particle) which distributed the aminium salt system compound and the electrification control agent.

[0053] According to this invention person's etc. examination, it is styrene as a binder resin. - When using an acrylic resin, it is possible by using polymerization methods, such as a suspension-polymerization method and an emulsion-polymerization method, to be able to obtain an about [submicron -2micrometer] globular form particle, and to make an electrification control agent contain in these particles. On the other hand, in the case of an epoxy resin or polyester resin with the large difference of a solubility parameter with a styrene-acrylic resin, detailed resin powder cannot be obtained by the describing [above] polymerization method, and a decomposition reaction produces and carries out functional loss of the aminium salt system compound in the polymerization process of these resins.

[0054] Then, this invention persons found out using the bisphenol A type or a female mold epoxy resin, and the amorphous-like polyester resin that makes main monomers the straight chain-like diol and terephthalic acid of the short chain which has a methyl side chain and has irregular carbon as a resin which distributes an aminium salt system compound. Even if these resins have the very high efficiency of comminution and it uses the usual jet mill, it becomes possible to obtain detailed powder 2 micrometers or less easily.

[0055] An aminium salt system compound (2) specifically as distribution or an indispensable composition monomer of the binder which carries out melting the carbon atomic number which has irregular carbon -- five or less short-chain chain-like diol -- more than 30 mol% and a terephthalic acid -- more than 30 mol% -- it contains -- polyester resin Or using the bisphenol A type or a bisphenol female mold epoxy resin, by kneading performing this distribution, it is 2 micrometers or less of mean particle diameters, and melting or the distributed resin impalpable powder is obtained for an aminium salt system compound (2) after that by grinding to 5 micrometers or less of maximum droplet sizes.

[0056] Furthermore, when toner-izing by condensation and heating according to examination of this invention persons, In addition to the binder resin which distributed the aminium salt system compound, and the binder resin which distributed the straight polarity electrification control agent Add the resin impalpable powder of further the low melting point, and only the resin of the low melting point fuses three sorts of these resins in the liquid phase. It becomes possible to be compatible in the melting and optical-absorption ability which whose reaction of an aminium salt system compound and a straight polarity electrification control agent decreased most, and was excellent when it was made to fix, and electrification control ability at the temperature which the binder resin which distributed the aminium salt system compound, and the binder resin which distributed the straight polarity electrification control agent do not fuse.

[0057] Beforehand an aminium salt system compound specifically Distribution or the impalpable powder of a binder resin which carried out melting (1st resin impalpable powder), Beforehand a straight polarity electrification control agent (3) The impalpable powder and/of distribution or the binder resin which carried out melting Or the thermoplastics impalpable powder of the low 3rd of melting temperature is made into an indispensable constituent from the impalpable powder (2nd resin impalpable powder) of the thermoplastics of a ** amine system functional-group resin, the 1st, and 2nd resin impalpable powders. the thermoplastics impalpable powder containing this resin impalpable powder -- the inside of the liquid phase -- setting -- several 10- after making it condense, these resin impalpable powders are made to fix tens of thousands particles by warming the liquid phase to the temperature which the 1st and 2nd resin impalpable powders do not fuse, but the 3rd resin impalpable powder fuses

[0058] Means (ii) The toner containing an aminium salt system compound is manufactured first. after that, the resin powder containing an electrification control agent or an electrification control agent is adhered to the periphery section of this toner -- making (henceforth "outside **") -- or By forming the film of the resin containing an electrification control agent or an electrification control agent in the surface of the toner containing an aminium salt system compound, it made it possible to give the optical-absorption capacity which was excellent in the interior of a toner in the electrification controllability again to a toner surface. Thereby, the toner which is compatible in fixing nature and an electrification property is obtained as the result.

[0059] The mean particle diameter of outside ****** has good 0.5 micrometers or less. As an electrification control agent, quarternary ammonium salt and a ** amine system functional-group resin can be used. In addition, although there are a method of **(ing) resin powder which is excellent in an electrification controllability outside as a means to give an electrification controllability to the surface of a toner, and the two methods of film-izing Although it is simple and has an advantage, like there is a cost merit when performing this invention by ** outside a resin Since outside ******** is held by the electrostatic force of the triboelectrification between both on the front face of the toner parent containing an aminium salt system compound, If both triboelectrification property does not exist in suitable level, it will be necessary to receive stress, such as stirring in a development counter, and to take into consideration the influence of outside **** seceding from a toner front face etc. For this reason, it is more more desirable to adopt the method of forming in a toner parent particle surface the resin film layer which is excellent in an electrification controllability.

[0060] Although it is also possible to adopt the method of dissolving the material of a film layer in a solvent and coating a toner parent particle front face by methods, such as spray dry, as a method of forming the film layer to a toner surface etc. As the film-ized method which agreed most for the purpose of this application After carrying out electrostatic adsorption of the impalpable powder of the resin which serves as material of a film layer at a mechanofusion method, i.e., a toner parent particle surface, a toner front face is heated and pressurized by the mechanical shock. as the result The method of making carry out melting of the impalpable powder of the resin used as the material of a film layer, and film-izing it is most suitable. In order that a mechanofusion method may not carry out this through a solvent etc., it does not cause the wide range dissolution of a toner parent front face, but depends it on the reaction of the aminium salt in a toner parent and the electrification control agent in film layer material being suppressed to the minimum as the result.

[0061] Meanses (iii), then these researchers as a means to solve this technical problem The reaction of an electrification control agent and an aminium salt system compound is prevented by considering as the functional discrete-type toner which gave optical-absorption ability at the thermoplastics powder which ** an electrification controllability outside on the front face of a toner particle again at the parent of a toner particle. And the function of the electrification control agent added mainly to the toner parent about the electrification property is employed efficiently. Moreover, the bird clapper was found out as it is possible to obtain the flash plate fixing ability which the aminium salt system compound added to outside ****** showed good optical-absorption ability, and generated heat, the whole toner fused when the heat carried out heat transfer from outside ****** to a toner parent, and was excellent in the fixing process.

[0062] As for the mean particle diameter of the resin impalpable powder which ** outside, it is desirable that it is [0.5 micrometer or more] 5.0 micrometers or less, and it is desirable for the content of the aminium salt system compound in a resin impalpable powder to be 50 or less % of the weight 10 % of the weight or more, for an addition to be 5 or less % of the weight 2 % of the weight or more outside the resin impalpable powder to a toner, and for the content of the aminium salt system compound to toner AUW to be 0.5 % of the weight or more. This is because the amount of the aminium salt system compound content resin impalpable powder adhering to a toner front face will decrease if a mean particle diameter is finer than the aforementioned range, and adhesion on a toner front face will become difficult on the other hand if too large. Moreover, being inadequate hatchet toner established becomes difficult [the addition of the aminium salt system compound to a toner total amount], if less than the aforementioned range about the amount of a resin impalpable powder, and the addition of the aminium salt system compound in a resin impalpable powder, and on the other hand, if many [too] It is because it becoming impossible to disregard the influence of the color tone of an aminium salt system compound to a toner color tone and the electric resistance of a resin impalpable powder are low and it is hard coming to carry out electrostatic adhesion of the resin impalpable powder by the bird clapper to a toner parent.

[0063] Moreover, although the quality of the material of the resin impalpable powder for outside ** depended on this invention is arbitrary if it is thermoplastics without reactivity with an aminium salt system compound In taking the method of obtaining a desired resin impalpable powder by pulverization of jet mill pulverization etc. after carrying out melting kneading of the aminium salt system compound to a resin impalpable powder as a manufacturing method of a resin impalpable powder the short-chain straight chain-like diol (five or less carbon number) which has the bisphenol A type or a bisphenol female mold epoxy resin, and a methyl side chain, and has irregular carbon -- more than 30 mol% and a terephthalic acid -- more than 30 mol% -- the included amorphous-like polyester resin is recommended Reactivity with an aminium salt system compound does not have the above-mentioned resin, and this has a very good

grindability, and is because the resin impalpable powder of a desired particle size can be obtained easily. Moreover, it is possible also by spraying the thermoplastics and the melting mixture of an aminium salt system compound which were dissolved in the organic solvent by the spray-drying method as the manufacture method of resin impalpable powders other than a grinding method.
[0064] The matter which has a reactant high functional group with the matter which contains this basic part more than an aminium salt system compound when making the matter which contains the basic part which has high reactivity with an aminium salt system compound in the toner containing a means (iv) aminium salt system compound live together in a toner, For example, by introducing the matter which has a sulfonic acid and a carboxylic acid, it found out that the reaction to the aminium salt system compound of the matter containing this basic part could be eased.
[0065] as a functional group which can demonstrate the effect of this invention, it is acid functional groups, such as a carboxylic acid and a sulfonic acid, etc., and poly acrylic resin, styrene-acrylic resin, etc. which make an indispensable monomer the ** carboxylic-acid monomer which has these functional groups, and which are polyester resin, an acrylic acid, etc. as matter can be found out Book
[0066] moreover, as matter containing the basic part introduced for the purpose of the plus electrification nature grant in this invention Although it is quarternary ammonium salt and a ** amine system functional-group resin and an effect is demonstrated in any [, such as a copolymer to which a ** amine system functional-group resin makes an indispensable monomer either styrene, acrylate and/or amino acrylate,] case it excelled more -- the amine conversion polyacrylate and amine conversion styrene-acrylate which make amino acrylate an indispensable monomer into a frame as matter containing the basic part introduced for the purpose of plus electrification nature grant demonstrate an effect
[0067] In this case, it is desirable for the equivalents of the acid functional group of the resin containing an acid functional group to be 1/2 - double precision to the amine equivalent of a ** amine system functional-group resin. In addition, although it is possible for the toner manufacturing process by the conventional method which carries out pulverization classification to also obtain an aminium salt system compound, the resin which gives plus electrification nature and/or a right electrification control agent, an acid functional-group content binder resin, a coloring material, etc. after melting kneading as for the toner by this invention Furthermore, a book First, the resin and/or right electrification control agent which give plus electrification nature into the binder resin containing an acid functional group, For example, after manufacturing the resin containing amine system functional groups, such as the 4th class ammonium and a styrene-dimethylaminoethyl methacrylate copolymer, and the resin mixture which carried out melting kneading, It is more more effective to perform 2 stage kneading which carries out melting kneading of the resin mixture, a coloring material, an aminium salt system compound, etc. again.
[0068] In addition, it is also possible to perform mixture with the resin and/or right electrification control agent which give plus electrification nature the inside of the binder resin containing an acid functional group by being the process which carries out the polymerization of one [what one or] resin, and adding the resin of another side.
[0069] Means (v) The binder resin which has the specific chemical structure found out loose plus electrification nature being shown and not spoiling the optical-absorption property and electrification grant property of an aminium salt system compound. As compared with aliphatic system tertiary amine and quarternary ammonium salt which are represented by the styrene-dimethylaminoethyl methacrylate copolymer etc., since base is a little weak, the binder resin by this invention cannot cause the salt abstraction reaction of an aminium salt system compound easily, and it has slack plus electrification to compensate the plus electrification property of an aminium salt system compound. The binder resin which fulfills the above-mentioned property can be found out in the thermoplastics which takes the structure which the amide group shown by nitrogen ring-like structure and/or -RCONH(s)2 (R is the benzene ring or zero to carbon-number 2 aliphatic hydrocarbon), such as an imidazole ring, a pyrimidine ring, a pyrrolidone ring, a pyrazole ring, a pyrroline ring, and a pyrrole ring, has configurated in the shape of a pendant in the binder chain. The thermoplastics with which are satisfied of the thermofusion property which has such structure and is searched for as a binder resin for toners, and a rheology property can be obtained as the styrene which made the vinyl system monomer and/or acrylamide system monomer which have nitrogen ring-like structures, such as a vinyl pyrrolidone, the indispensable composition monomer, and a styrene-acrylate copolymer.
[0070] As for the copolymerization ratio of the monomer which has the aforementioned acrylamide system monomer and nitrogen ring-like structure, it is desirable that it is less than [more than 10 mol%20 mol%]. This is because the case where the grade of the salt abstraction reaction over an aminium salt system compound exceeds tolerance may arise rarely while it becomes difficult to satisfy the thermofusion property searched for as a binder resin for toners and a rheology property, using such a monomer abundantly, when there is a case which does not show the plus electrification property of the request of a binder resin by a copolymerization ratio being less than [10 mol%] and 20 mol% is exceeded.

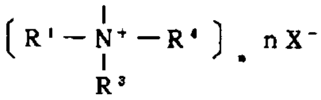
[0071] moreover, as a binder which shows loose plus electrification nature and does not spoil the optical-absorption property and electrification grant property of an aminium salt system compound Besides the binder which has the pendant structure of the aforementioned amide group or a nitrogen ring Amine conversion polyester resin which makes amide system resins, such as an amide monomer and polyamide resin, a ** amino dicarboxylic acid, or a ** amino diol an indispensable composition monomer (specifically), Amide closure according to a monoamine in 10 - 30% of the carboxylic-acid end to polyester resin with the 15 or more acid numbers, Or amine conversion polyester which gave bridge formation by the diamine, urethane conversion polyester resin which carried out urethane closure of the hydroxyl group of an end by the isocyanate etc. (specifically) The urethane conversion polyester resin which carried out urethane closure of the 20% or more of the alcoholic end, the amine conversion epoxy resin over which the both ends of a diamine reacted to with the hydroxyl group of an epoxy resin, and constructed the bridge are found out to polyester resin with ten or more OH **.

[0072] When using an amide monomer as a binder, since it is compatible in a thermofusion property and the filming-proof nature to a photoconductor drum, it is desirable to use a with a molecular weight of about 500 to 3000 compound. In addition, in order to give plus electrification nature by using a ** amino monomer since polyester resin generally has the minus electrification property and to satisfy the requirements for this invention, when it is urethane conversion polyester resin, it is desirable [the copolymerization ratio of a ** amino monomer / less than / more than 10 mol%30ml% / is desirable, and] for OH ** to carry out urethane closure of the 20% or more of the alcoholic end of ten or more polyester resin.

[0073] In order to prevent means (vi) salt exchange reaction, when the electrification control agent which has salt structures, such as quarternary ammonium salt, was used, the anion which constitutes an aminium salt system compound, and the anion which constitutes the electrification control agent which has salt structure were made into the common ion. That is, it is a general formula (3) as a straight polarity electrification control agent.

[0074]

[Formula 21]



$$\left[R^1-\overset{\overset{\displaystyle R^2}{|}}{\underset{\underset{\displaystyle R^3}{|}}{N^+}}-R^4\right]_n nX^-\qquad\cdots(3)$$

（式中、R^1～R^4は任意のアルキル基、フェニル基又はその誘導体であり、X^-は一般式（1），（2）と同一の陰イオンである。）

[0075] It comes out and the quarternary ammonium salt expressed is used. Consequently, a structural change of an aminium salt system compound and an electrification control agent is not produced, but an aminium salt system compound and an electrification control agent maintain an original function, and the toner which is compatible in fixing nature and an electrification property is obtained. As an aminium salt system compound with the light color tone of a light field, a perchlorate, boron-fluoride acid chloride, hexafluoro arsenic acid chloride, a hexafluoro antimonate, and alkyl-sulfonic-acid salts are found out highly [infrared light absorbing power]. It is sulfonate system quarternary ammonium salt and molybdate system quarternary ammonium salt which are regularly used as high quarternary ammonium salt of an electrification controllability on the other hand. As an anion kind which demonstrates the property excellent in both the optical-absorption ability of an aminium salt system compound, and the electrification controllability of quarternary ammonium salt, the anion of sulfonic-acids ion and molybdic-acid ion is found out. Moreover, although a comparatively good property is shown when perchloric acid ion and boron-fluoride acid ion are used as an anion kind, when perchloric acid ion and boron-fluoride acid ion are used as an ion kind, the room of an improvement is left behind a little to the electrification controllability, especially electrification standup capacity by the side of quarternary ammonium salt. Then, in the toner with which an advanced electrification control function is demanded, when choosing perchloric acid ion and boron-fluoride acid ion as a common anion kind, it is checking that the outstanding performance is obtained by using together sulfonate system quarternary ammonium salt and molybdate system quarternary ammonium salt of a ultralow volume as an electrification control agent. In addition, if the quarternary ammonium salt which has the anion of an aminium salt system compound and a different anion is used in this case, although risk of the aforementioned salt exchange reaction arising exists If the addition of the quarternary ammonium salt from which an anion differs is 1/5Eq or less of the addition of an aminium salt system compound Although some aminium salt system compounds carry out functional loss, it becomes possible for the infrared light absorptance in the whole toner not to decline so much, but to reconcile the outstanding electrification control function and infrared light absorbing power of it.

[0076] Moreover, it is also possible to use an amine system compound together as a binder resin or other additives, and to aim at an improvement of the electrification control function of a toner. Although it has possibility that the amine system compound in this case will also cause the ion abstraction reaction of an aminium salt system compound As well as the above-mentioned sulfonate system quarternary ammonium salt or molybdate system quarternary ammonium salt, if the amount of the amine system compound which exists in a toner is 1/5Eq or less of the addition of an aminium salt It becomes possible not to reduce the infrared light absorptance in the whole toner so much, and for its electrification control function of a toner to improve by existence of an amine machine, and to reconcile the outstanding electrification control function and infrared light absorbing power.

[0077] If the compound which is shown by the general formula (1) according to research is compared with the compound shown by the general formula (2), means (vii) this invention persons While plus electrification nature has the advantage that it is high and optical-absorption ability is high, compared with the compound shown by the general formula (1), the compound of a general formula (2) Use of only the compound which tone has the problem of being a little deep, and is shown by the general formula (2) as an infrared light absorbent looked at the inclination for the color tone of a color toner to be a little somber. Then, this invention persons found out that what satisfies electrification capacity, optical-absorption capacity, and a color tone was obtained by blending and using the compound shown by the general formula (1), and the compound shown by the general formula (2).

[0078] In addition, in order to prevent the influence on a color toner according to examination of this invention persons, as for the blend ratio of a general formula (1) and a general formula (2), it is desirable to make the compound (divalent) of a general formula (2) into 20 - 40 % of the weight for the compound (univalent) of a general formula (1) 60 to 80% of the weight. Moreover, this invention persons have found out that, as for an aminium salt system compound, the toner with which reactivity with the electrification ability, the color tone in a visible region, optical-absorption ability, and an electrification control agent is satisfied of electrification capacity, optical-absorption capacity, and a color tone as well as the case where the compound of the aforementioned general formula (1) and a general formula (2) is used together and used by differing a little, using these together timely and using them is obtained with an anion kind.

[0079] According to research, means (viii) this invention persons The aromatic dithiol and mercapto phenol which are shown by the aminium salt system compound shown by the compound shown by the general formula (1), and the general formula (2), and general formula (4) - (8), and the ammonium salt and the poly ENIRIDEN screw benzoquinones of a diamine system metal complex, By using together the compound which has infrared light absorbing power, such as a phthalocyanine system [when a quarternary-ammonium-salt system electrification control agent is added to a toner] In order that the compound which expresses with a quarternary-ammonium-salt system electrification control agent and general formula (4) - (8) which does not react might compensate the optical-absorption ability of the aminium salt system compound lost by the reaction with quarternary ammonium salt, it found out that it was possible to give good optical-absorption ability to a color toner.

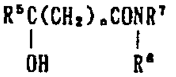
[0080] In addition, for the compound of a dithiol system and a general formula (5), the compound of a mercapto phenol, a mercapto naphthol system, and a general formula (6) is [the compound of a general formula (4) / the compounds of the poly ENIRIDEN screw benzoquinone system and a general formula (8) of the compound of a diamine system and a general formula (7)] a phthalocyanine and a naphthalocyanine system. In order to stop in tolerance the influence of the color tone on the fixing smell generated when using the ammonium salt of an aromatic dithiol, a mercapto phenol, and a diamine system metal complex, and the poly ENIRIDEN screw benzoquinones as an infrared light absorbent used together, or a color toner, the content of the infrared light absorbent used together needs to be 0.5 or less % of the weight desirably 1 or less % of the weight.

[0081] Although a fixing smell does not pose a problem so much on the other hand when using a phthalocyanine system compound as an infrared light absorbent used together, the color tone in the visible region of these phthalocyanines system compound Since the influence which it has on a toner color tone is large when it is strong blue - green in many cases and little addition is carried out at a toner, When adding to toners of a color tone peculiar to a phthalocyanine system compound, and a different color tone, such as red and a yellow toner, it is necessary to stop a content to 0.2 or less % of the weight desirably 1 or less % of the weight too.

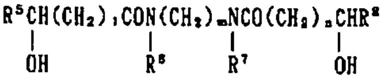
[0082] The amide compound particle expressed with general formula (9) - (11) is made to adhere to a toner front face further in the desirable embodiment of this invention (outside **).

[0083]

[Formula 22]

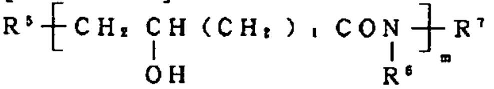


$$R^5C(OH)(CH_2)_nCON(R^6)R^7 \quad \cdots (9)$$



$$R^5CH(OH)(CH_2)_lCON(R^6)(CH_2)_mN(R^7)CO(CH_2)_nCH(OH)R^8 \quad \cdots (10)$$

[0084] As for l, m, and n, the integer of 0-4 and R5 -R8 are hydrogen, an alkyl group, a halogenation alkyl group, an aryl group, or a halogenation aryl group among [a formula (9) and (10).]
[0085]
[Formula 23]



$$R^5\left[CH_2CH(OH)(CH_2)_lCON(R^6)\right]_mR^7 \quad \cdots (11)$$

[0086] Among [formula (11), l and m are a positive integer and R5 -R7 is the same as the above-mentioned definition.]
It found out that the flash plate fixing nature of a toner could be raised, without generating side effects, such as toner blocking and occurrence of filming over a photoconductor drum, by **(ing) so much the amide compound powder which has a hydroxyl group in the molecular structure proper quantity outside to a toner.
[0087] What the following phenomena produce as a mechanism which shows this effect is presumed. First, in this toner, melting of the whole toner is preceded a little and the amide compound which is outside ****** fuses. Lower [the melting point] than the binder resin which has the polar big part of an amide group (amide combination to include), a hydroxyl group, etc. in the molecular structure, and has so high compatibility for the fiber of paper, and constitutes a toner, since the fused amide compound has low melt viscosity, it permeates between the fiber of paper quickly. According to this effect, the wettability of the fused binder resin to the fiber of paper increases, a binder resin with a little high melt viscosity (toner parent) also permeates between the fiber of paper, and firm fixing nature is demonstrated. For this reason, the amount of optical absorptions of a toner is not enough, and since a binder resin is low temperature, good fixing nature can be given also in the state where melt viscosity is high.
[0088] The amide compound in which such a property is shown can be found out out of a hydroxy fatty-acid monochrome amide, hydroxy fatty-acid screw amides, the polyamide oligomer of hydroxy-group content of low molecular weight, etc. in addition, the weight average molecular weight of an amide compound is 500 or more and 3000 or less -- it is desirable Since an amide compound will serve as elasticity if molecular weight is less than this range, it is easy to generate drum filming, and on the other hand, this has the high viscosity at the time of melting in many cases in it being 3000 or more, and is for being hard to demonstrate an effect.
[0089] Moreover, in order to demonstrate an effect good, an amide resin needs to fuse earlier than a toner parent, and it is needed that the viscosity at the time of melting is low. For this reason, the melting temperature of the amide compound which ** outside is lower than the melting temperature of the binder resin which forms a toner parent 10 degrees C or more, and is the melting temperature field of the melting toner near the recording paper. The melt viscosity in a 100-150-degree C field needs to become lower than the melt viscosity of the binder resin which forms a toner parent.
[0090] in addition, although it is possible to acquire the same effect also in the toner which carried out inner ** (melting kneading is carried out with a binder resin) of the amide compound to the toner, 20% of the weight or more of addition is desirably needed [as for an amide compound] at least 5% of the weight or more in this case However, if there are many compounds weak at comparatively elasticity, and they add to a toner the amide compound which has such a property in large quantities and the amide compound to be used will print over a long period of time, the so-called drum filming by which the thin film of an amide compound is formed on a photoconductor drum will occur, and it will cause printing obstacles, such as a ground fogging. Even if it faces the use over a long period of time, in order to prevent generating of drum filming, the amount of the amide compound in a toner total amount needs to be 1 or less % of the weight desirably at least 2 or less % of the weight. It is more desirable to add an amide compound to a toner by outside **, in order to demonstrate the aforementioned good fixing effect with the addition of such an amide compound.
[0091] Moreover, as for the particle size of the amide compound which ** outside, it is desirable for an average of 2 micrometers or less and a maximum droplet size to be 5 micrometers or less. If the particle size of the amide compound which ** outside exceeds the aforementioned range, since this will stop adhering to a toner front face homogeneously and will become easy to secede from a toner, it is to become easy to produce the problem of an amide

compound being accumulated in a development counter. In addition, it is taken notice of that this mode is effective not only when means (i) - (viii) is merged, but in any toners for flash plate fixing.

[0092] As for the manufacture method of the color toner for flash plate fixing of this invention explained in each of manufacture method above-mentioned each means of a toner, both a general process and a special process are offered by this invention. Although the concrete explanation is as aforementioned and is not repeated, the process indicated especially to the claim is peculiar.

[0093]

[Example] this invention is not limited by this example, although a still more detailed example is shown below and this invention is explained to it still in detail.

[0094]

The strongest luminescence wavelength of the xenon lamp for optical-absorption wavelength measurement flash plate fixing of an infrared light absorbent addition binder resin is 800-1000nm. Then, the aminium salt system compound whose anion it is expressed with a general formula (1) and is perchloric acid ion (in the following examples, unless it mentions specially) this aminium salt system compound was used 1wt% -- the added various resins -- evaluation resin powder and an aminium salt system compound -- the inside of a stainless steel petri dish -- putting in -- a 150-degree C hot plate top -- loose -- melting mixture -- carrying out (in this case) The color tone was started on the thin film film after cooling the resin after check mixture radiationally, and the optical-absorption property was investigated with the infrared absorbance plan.

[0095] A result is shown in Table 1.

[0096]

[Table 1]

表 1

樹脂名（いずれもアミニウム塩系化合物１％添加済）	800～1000nmでの光吸収率	色調
〔ベース〕		
①ポリエステル樹脂	92～95％吸収	薄緑色
②ポリエステル樹脂＋４級アンモニウム塩１％添加	15～20％吸収	褐色
〔アミン樹脂〕		
③メチルメタクリレート(66mol％) －ジメチルアミノエチルメタクリレート(34mol％)	35～50％吸収	褐色
④メチルメタクリレート(80mol％) －ジメチルアミノエチルメタクリレート(20mol％)	40～60％吸収	褐色
⑤スチレン(70mol％) －ジメチルアミノエチルメタアクリレート(30mol％)	30～40％吸収	褐色
⑥スチレン(80mol％) －ジメチルアミノエチルメタアクリレート(20mol％)	30～40％吸収	褐色
⑦スチレン(90mol％) －ジメチルアミノエチルメタアクリレート(10mol％)	45～60％吸収	茶色
〔環状含窒素樹脂〕		
⑧スチレン(80mol％) －ビニルピロリドン(20mol％)	66～80％吸収	薄緑色
⑨メチルメタクリレート(85mol％) －ビニルピリミジン(15mol％)	70～84％吸収	薄緑色
〔アミド系〕		
⑩スチレン(80mol％) －ジメチルアクリルアミド(20mol％)	82～90％吸収	薄緑色
⑪スチレン(35mol％) －ジメチルアクリルアミド(35mol％) －メチルメタクリレート(30mol％)	85～92％吸収	薄緑色
⑫プロピレンビスヒドロキシアラキン酸アミド	92～98％吸収	薄緑色
〔一般スチレン－アクリル〕		
⑬スチレン(75mol％) －２エチルヘキシルアクリレート(25mol％)	70～80％吸収	薄緑色
⑭スチレン(75mol％) －ｎブチルアクリレート(25mol％)	77～88％吸収	薄緑色
〔その他〕		
⑮末端ウレタン封止ポリエステル	75～85％吸収	薄緑色
⑯ピリジン環含有ポリエステル（構造不明）	88～94％吸収	薄緑色
⑰末端アミド封止ポリエステル（推定アミド含有5mol％）	－	薄緑色
⑱末端アミド封止ポリエステル（推定アミド含有15mol％）	－	茶緑
⑲末端アミド封止ポリエステル（推定アミド含有25mol％）	－	茶色
⑳Nアミノエチルピペラジン架橋エポキシ	－	薄緑色
㉑メタキシレンジアミン架橋エポキシ	85～92％吸収	薄緑色

[0097] Using the polyester resin which uses the ethyleneoxide addition product of bisphenol A as a main diol component, and uses a terephthalic acid as a main dicarboxylic-acid component as (Means i) [example 1] one binder resin 1-1, it is expressed with a general formula (1) to this, and an anion adds the aminium salt system compound 2 which is perchloric acid ion 2%, and carries out melting kneading. This kneading product is called A.

[0098] Next, quarternary ammonium salt is added 1% as a straight polarity electrification control agent 3, using styrene-acrylic resin (styrene-methylmethacrylate-n butyl methacrylate copolymer) as a binder resin 1-2, further, a bromine-ized copper phthalocyanine is added as a coloring material 4, a polypropylene wax is added 1% as a fixing assistant 5 2%, and melting kneading is carried out. This kneading product is called B.

[0099] In addition, when the difference of the solubility parameter of the used polyester resin and styrene-acrylic resin was computed, the value was about about 0.8. Subsequently, after blending the coarse-grinding object of the kneading product A and the kneading product B by the ratio of 7:3 after that, melting kneading was carried out further and Toner C was obtained by carrying out pulverization classification after that. This toner C was developer-ized combining the ferrite carrier, and the goods number carried in the printer (made in Fujitsu) of F6718K, and investigated the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment.

[0100] Consequently, the outstanding fixing nature of 90% of rates of fixing (tape friction test) was shown. Moreover, after being exposed to the environment under 35 degrees C of developers, and 80%RH about electrification capacity for 12 hours, when development counter stirring was performed for 3 minutes under this environment, it is stirring for 3 minutes and the electrification recovery (this value being hereafter called electrification recovery factor) to about 80% of the amount of electrifications in an ordinary temperature normal-relative-humidity state being shown, and having the outstanding electrification capacity was checked.

[0101] In addition, instead of the polyester resin used by this example, even if it uses styrene-butadiene resins instead of a polyester system resin and/or a polyamide system resin, and styrene-acrylic resin, an effect equivalent to this example can be acquired. The effect in the combination of binder resins other than polyester resin and styrene-acrylic resin is shown in the following table.

[0102]

Binder resin 1-1 Binder resin 1-2 Rate of fixing % electrification recovery-factor % polyester A styrene-acrylic 90 80 Polyester A styrene-acrylic 85 95 Polyester Styrene-butadiene 80 95 Epoxy Styrene-acrylic 100 80 Polyamide Styrene-acrylic 75 80 [0103] [Example 2] Using the polyester resin which uses the ethyleneoxide addition product of bisphenol A as a main diol component, and uses a terephthalic acid as a main dicarboxylic-acid component as a binder resin 1-1, to this, 2% and a polypropylene wax are added for 2% and a bromine-ized copper phthalocyanine 1%, and melting kneading of the aminium salt system compound is carried out. This kneading product is called D.

[0104] Toner E was obtained by carrying out pulverization classification of the binder resin 1-2 of the amine conversion styrene-acrylic which makes this kneading product D and dimethylaminoethyl methacrylate an indispensable composition monomer after melting kneading by the ratio of 9:1. By the same method of showing this toner E in an example 1, when fixing nature and electrification capacity were investigated, the outstanding property of 85% of rates of fixing and 70% of electrification recovery factors was acquired.

[0105] [Example 3] The amine conversion styrene-acrylic resin in an example 2 obtained Toner F like the example, except that it was the particle of the submicron particle size of 200 degrees C or more of melting points. By the same method of showing this toner F in an example 1, when fixing nature and electrification capacity were investigated, the outstanding property of 80% of rates of fixing and 90% of electrification recovery factors was acquired.

[0106] [Example 4] Toner G was obtained by carrying out trituration classification of the kneading product D formed in the example 2, and the resin styrene-acrylic resin (styrene-n butyl acrylate copolymer) which added quarternary ammonium salt 2% at the time of resin composition after melting kneading by the ratio of 7:3. By the same method of showing this toner G in an example 1, when fixing nature and electrification capacity were investigated, the outstanding property of 85% of rates of fixing and 70% of electrification recovery factors was acquired.

[0107] [Example 5] To the bisphenol A type epoxy resin (weight per epoxy equivalent 900), the aminium salt system compound was pulverized to 2 micrometers or less with the jet mill after 3% kneading [melting], and the trituration product H was obtained. Moreover, the globular form resin of the submicron particle size of the styrene-n butyl acrylate-methyl methacrylate copolymer containing quarternary ammonium salt was obtained by the emulsion-polymerization method. Warmed these resins and the trituration product H, and the bromine-ized copper phthalocyanine at 120 degrees C, they was made to condense and fix them in the pressurization aqueous phase, and Toner I was obtained.

[0108] By the same method of showing this toner I in an example 1, when fixing nature and electrification capacity were investigated, the outstanding property of 90% of rates of fixing and 70% of electrification recovery factors was acquired.

[0109] [Example 6] Toner J was obtained like the example 5 except changing the bisphenol A type epoxy resin formed in the example 5 into weight-average-molecular-weight about 6000 polyester resin which makes 1, 2-propylene glycol, neopentyl glycol, and a terephthalic acid an indispensable composition monomer.

[0110] By the same method of showing this toner J in an example 1, when fixing nature and electrification capacity were investigated, the outstanding property of 90% of rates of fixing and 75% of electrification recovery factors was acquired.

[0111] [an example 7] -- the styrene-n butyl acrylate resin of 90 degrees C of melting points -- 30 weight sections addition -- carrying out -- and warming -- Toner K was obtained like the aforementioned example 6 except making temperature into 90 degrees C By the same method of showing this toner K in an example 1, when fixing nature and electrification capacity were investigated, the outstanding property of 100% of rates of fixing and 85% of electrification recovery factors was acquired.

[0112] [the example 1 of comparison] -- the polyester resin which uses the ethyleneoxide addition product of bisphenol A as a main diol component, and uses a terephthalic acid as a main dicarboxylic-acid component as a binder resin -- using -- this -- receiving -- 2% [of aminium salt system compounds], 2% [of bromine-ized copper phthalocyanines], and polypropylene wax 1% -- melting kneading was added and carried out and Toner L was obtained by carrying out trituration classification after that

[0113] Although it was 100% of rates of fixing when fixing nature and electrification capacity were investigated by the same method of showing this toner L in an example 1, since an electrification recovery factor became 30% or less and the straight polarity electrification control agent was not added in this example of comparison, electrification capacity was a low thing very much.

[0114] [Example 2 of comparison] If it removed having added the quaternary ammonium salt expressed with chemical formula [(C14H29)2(CH3)2 N+] 4 Mo8 O264- as a straight polarity electrification control agent 1%, Toner M was obtained like the example 1 of comparison. When fixing nature and electrification capacity were investigated by the same method of showing this toner M in an example 1, 20% or less of rates of fixing and the electrification recovery factor became 40% or less, and both optical-absorption nature and the electrification property were low, and it became the green shell brown of the color tone to which a coloring material also has the color tone of a toner further.

[0115] In this example of comparison, since the straight polarity electrification control agent and the aminium salt system compound were added to two or more not a binder resin but independent binders, the above inconvenient results were brought.

[0116] [Example 3 of comparison] The kneading product A was obtained like the aforementioned example 1. Furthermore, quaternary ammonium salt is added 1% as a straight polarity electrification control agent using the carboxylic-acid conversion styrene-acrylic resin which makes a methacrylic acid an indispensable composition monomer, further, a bromine-ized copper phthalocyanine is added as a coloring material, a polypropylene wax is added 1% as a fixing assistant 2%, and melting kneading is carried out. This kneading product is called N. In addition, the value was about 0.2 when the difference of the solubility parameter of the used polyester resin and carboxylic-acid conversion styrene-acrylic resin was computed. Toner O was obtained by carrying out trituration classification of the kneading product A and the kneading product N after melting kneading by the ratio of 8:2.

[0117] By the same method of showing this toner in an example 1, when fixing nature and electrification capacity were investigated, it is 45% of rates of fixing, and 60% of electrification recovery factors, and a target performance was not reached. Moreover, although full compatibility had not been carried out when the distributed state of the kneading product A in Toner O and the kneading product N was investigated, the composition of clear "sea island structure" was not found.

[0118] [Example 4 of comparison] Manufacture of a toner was tried like the example 5 except using the polyester resin which uses the ethyleneoxide addition product of bisphenol A as a main diol component for the bisphenol A type epoxy resin, and uses a terephthalic acid as a main dicarboxylic-acid component as a resin which distributes an aminium salt system compound.

[0119] However, the resin which distributed the aminium salt system compound in the example 4 of comparison was impossible for being able to grind only to the particle size of about 4-6 micrometers, but using this trituration product, making it condense and fix in the aqueous phase, and obtaining an about 10-12-micrometer toner in the usual jet grinding.

[0120] The toner P which **(ed) divinylbenzene-styrene-dimethylaminoethyl methacrylate copolymer-resin powder outside was obtained by using and carrying out mixed stirring of the divinylbenzene-styrene-dimethylaminoethyl methacrylate copolymer-resin powder (0.1 micrometers of 5:75:20-/mean particle diameters [Copolymerization ratio; divinylbenzene : styrene : dimethylaminoethyl methacrylate =]) for 2wt(s)% and a Henschel mixer to the toner L of the example 1 of the means (ii) [example 8] comparison.

[0121] When the amount of electrifications combined with the Mn-Zn system ferrite carrier which coated with methyl methacrylate was measured, the amount of electrifications in the ordinary temperature normal-relative-humidity environment of Toner P was 20microC/g. Subsequently, after exposing a developer to the environment under 35 degrees C and 80%RH for 12 hours, when development counter stirring was performed for 3 minutes under this environment, having the electrification capacity which showed the electrification recovery (this value is hereafter called electrification recovery factor) to about 75% of the amount of electrifications in an ordinary temperature normal-relative-humidity state, and was excellent in stirring for 3 minutes was checked.

[0122] Moreover, when it carried in F6718K printer (made in Fujitsu) combining the aforementioned methyl methacrylate coat ferrite carrier and Toner P and the printing property was investigated, 100,000 sheets were covered and the outstanding printing property was shown.

[0123] [Example 9] [(C14H29)2(CH3) 2 The styrene-n butyl acrylate copolymer-resin powder (0.1 micrometers of 75:25-/mean particle diameters [Copolymerization ratio; styrene : n-butyl acrylate =]) which made the quarternary ammonium salt shown with the chemical formula of N+]4 Mo8 O264- incorporate in polymerization process 2wt(s)%, By carrying out mixed stirring using a Henschel mixer to the toner L of the example 1 of comparison, it **(ed) outside and Toner Q was obtained.

[0124] When the amount of electrifications was measured combining the Mn-Zn system ferrite carrier which coated with methyl methacrylate, the amount of electrifications in the ordinary temperature normal-relative-humidity environment of Toner Q was 22microC/g. Subsequently, after exposing a developer to the environment under 35 degrees C and 80%RH for 12 hours, when development counter stirring was performed for 3 minutes under this environment, having the electrification capacity which showed the electrification recovery to about 90% of the amount of electrifications in an ordinary temperature normal-relative-humidity state, and was excellent in stirring for 3 minutes was checked.

[0125] Moreover, when it carried in F6718K printer (made in Fujitsu) combining the aforementioned methyl methacrylate coat ferrite carrier and Toner Q and the printing property was investigated, 100,000 sheets were covered and the outstanding printing property was shown.

[0126] [Example 10] It added to the toner L of the example 1 of comparison 4wt(s)%, the quarternary-ammonium-salt content styrene-n butyl acrylate copolymer-resin powder (0.1 micrometers of 75:25-/mean particle diameters [Copolymerization ratio; styrene : n-butyl acrylate =]) used in the example 2 was thrown into high BURIDAIZA (product made from the Nara machine), and the toner R which covered the front face of Toner L with the quarternary-ammonium-salt content styrene-n butyl acrylate copolymer resin was obtained by adding pressurization and a shock.

[0127] When the amount of electrifications was measured combining the Mn-Zn system ferrite carrier which coated with methyl methacrylate, the amount of electrifications in the ordinary temperature normal-relative-humidity environment of Toner R was 25microC/g. Subsequently, after exposing a developer to the environment under 35 degrees C and 80%RH for 12 hours, when development counter stirring was performed for 3 minutes under this environment, having the electrification capacity which showed the electrification recovery to about 85% of the amount of electrifications in an ordinary temperature normal-relative-humidity state, and was excellent in stirring for 3 minutes was checked.

[0128] Moreover, when it carried in F6718K printer (made in Fujitsu) combining the aforementioned methyl methacrylate coat ferrite carrier and Toner R and the printing property was investigated, 100,000 sheets were covered and the outstanding printing property was shown.

[0129] [an example 11] -- the toner L of the example 1 of comparison -- receiving -- styrene-methylmethacrylate-dimethylaminoethyl methacrylate copolymer-resin powder (0.1 micrometers of 75:10:15-/mean particle diameters [Copolymerization ratio; styrene : methyl methacrylate : dimethylaminoethyl methacrylate =]) -- 4wt(s)% -- it added and the toner S which covered the surface with the styrene-methylmethacrylate-dimethylaminoethyl methacrylate copolymer resin was obtained like the example 10

[0130] When the amount of electrifications was measured combining the Mn-Zn system ferrite carrier which coated with methyl methacrylate, the amount of electrifications in the ordinary temperature normal-relative-humidity environment of Toner S was 22microC/g. Subsequently, after exposing a developer to the environment under 35 degrees C and 80%RH for 12 hours, when development counter stirring was performed for 3 minutes under this environment, having the electrification capacity which showed the electrification recovery to about 90% of the amount of electrifications in an ordinary temperature normal-relative-humidity state, and was excellent in stirring for 3 minutes was checked.

[0131] Moreover, when it carried in F6718K printer (made in Fujitsu) combining the aforementioned methyl methacrylate coat ferrite carrier and Toner S and the printing property was investigated, 100,000 sheets were covered and the outstanding printing property was shown.

[0132] [Example 5 of comparison] When the amount of electrifications was measured about the toner L illustrated in the example 1 of comparison combining the Mn-Zn system ferrite carrier which coated with methyl methacrylate, the amount of electrifications in ordinary temperature normal-relative-humidity environment was 12microC/g. Subsequently, after exposing a developer to the environment under 35 degrees C and 80%RH for 12 hours, when development counter stirring was performed for 3 minutes under this environment, by stirring for 3 minutes, it is about 40% of the amount of electrifications in an ordinary temperature normal-relative-humidity state, and it became clear that it is hard to carry out electrification recovery.

[0133] Moreover, it carries in F6718K printer (made in Fujitsu) combining the aforementioned methyl methacrylate coat ferrite carrier and Toner L. When a printing property is investigated, it sets to the continuation running examination under ordinary temperature environment. In the running examination under the time of the re-drive although the printing property which was excellent over 100,000 sheets was shown, after suspending a printer two days or more, or a high-humidity/temperature environment The ground fogging and superfluous development based on the amount of electrifications of a developer fully not being recovered arose, and the printing property to satisfy was not acquired.

[0134] [Example 6 of comparison] The ** toner T outside a resin was obtained like the example 8 except using as styrene-methylmethacrylate-dimethylaminoethyl methacrylate copolymer-resin powder (1.0 micrometers of 75:10:15-/mean particle diameters [Copolymerization ratio; styrene : methyl methacrylate : dimethylaminoethyl methacrylate =]) the resin impalpable powder which ** outside.

[0135] When the amount of electrifications was measured combining the Mn-Zn system ferrite carrier which coated with methyl methacrylate about Toner T, the amount of electrifications in ordinary temperature normal-relative-humidity environment was 22microC/g. Subsequently, after exposing a developer to the environment under 35 degrees C and 80%RH for 12 hours, when development counter stirring was performed for 3 minutes under this environment, having the electrification capacity which showed about 80% of the amount of electrifications in an ordinary temperature normal-relative-humidity state, and was excellent in stirring for 3 minutes was checked.

[0136] Moreover, although the outstanding printing property was shown if about 20,000 sheets were covered from the first stage when it carried in F6718K printer (made in Fujitsu) combining the aforementioned methyl methacrylate coat ferrite carrier and Toner T and the printing property was investigated, the amount of electrifications came to show after that printing against which only elevation rubbed rapidly. When this cause was investigated, the resin powder which ** (ed) outside was not fully held on a toner front face, but by long-term use, resin powder ****ed [the toner front face] gradually, and being accumulated in a development counter became clear.

[0137] Quarternary ammonium salt was added 1% as an electrification control agent using the polyester resin which uses a terephthalic acid as a main dicarboxylic-acid component as a means (iii) [example 12] binder resin by using the ethyleneoxide addition product of bisphenol A as a main diol component, further, the bromine-ized phthalocyanine was added as a coloring material, the polypropylene wax was added 1% as a fixing assistant 2%, melting kneading was carried out, and the base toner U was obtained by grinding in particle size of 5-20 micrometers.

[0138] moreover -- as a binder resin -- the bisphenol A type epoxy resin -- using -- this -- an aminium salt system compound -- 20wt(s)% -- melting kneading was added and carried out and the aminium salt system compound content resin impalpable powder V with a particle size of 0.5-5 micrometers was obtained Subsequently, outside ****** was performed [the aminium salt system compound content resin impalpable powder V] for 3wt(s)% using the super mixer to the base toner U, and Toner W was obtained.

[0139] This toner W was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 75% of rates of fixing (tape friction test) was shown. Moreover, after being exposed to the environment under 35 degrees C of developers, and 80%RH about electrification capacity for 12 hours, when development counter stirring was performed for 3 minutes under this environment, it is stirring for 3 minutes and the electrification recovery (this value being hereafter called electrification recovery factor) to about 75% of the amount of electrifications in an ordinary temperature normal-relative-humidity state being shown, and having the outstanding electrification capacity was checked.

[0140] [an example 13] -- the polyester resin which uses 1 and 3 butanediol as a main diol component, and uses a terephthalic acid as a main dicarboxylic-acid component as a binder resin -- using -- this -- an aminium salt system compound -- 20wt(s)% -- melting kneading was added and carried out and the aminium salt system compound content resin impalpable powder X with a particle size of 0.5-5 micrometers was obtained

[0141] Subsequently, outside ****** was performed [the aminium salt system compound content resin impalpable powder X] for 4wt(s)% using the super mixer to the base toner U, and Toner Y was obtained. This toner Y was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 80% of rates of fixing (tape friction test) was shown. Moreover, about 85% of electrification recovery factor being shown about electrification capacity, and having the outstanding electrification capacity was checked.

[0142] [Example 14] The aminium salt system compound content resin impalpable powder Z with a particle size of 0.5-2.0 micrometers was obtained by carrying out spray drying by the spray dryer after dissolving bisphenol A type epoxy, 60wt(s)%, and aminium salt system compound 40wt% in a methyl-ethyl-ketone solvent. Subsequently, outside ****** was performed [the aminium salt system compound content resin impalpable powder Z] for 2wt(s)% using the super mixer to the base toner U, and Toner alpha was obtained.

[0143] This toner alpha was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 90% of rates of fixing (tape friction test) was shown. Moreover, about 90% of electrification recovery factor being shown about electrification capacity, and having the outstanding electrification capacity was checked.

[0144] [Example 7 of comparison] When fixing nature and electrification capacity were investigated by the same way an example 12 shows a toner, about **-SUTONAU illustrated in the example 12, although the electrification recovery factor showed 80%, it was not established at all but was dissatisfied.

[0145] [Example 8 of comparison] The polyester resin which uses the ethyleneoxide addition product of bisphenol A as a main diol component, and uses a terephthalic acid as a main dicarboxylic-acid component is used. on the other hand, an aminium salt system compound -- 20wt(s)%, although melting kneading was added and carried out and manufacture of an aminium salt system compound content resin impalpable powder with a particle size of 0.5-5 micrometers was tried Although only the powder whose particle size is about 4-8 micrometers was obtained (outside ********beta), but outside ****** was performed [this resin powder to the base toner U] for 3wt(s)% using the super mixer and Toner gamma was obtained, outside ******** does not carry out electrostatic adhesion at the base toner gamma. It was what outside ******** disperses in printer equipment and does not bear practical use.

[0146] Although according to means (iv) this invention persons' knowledge the kneading object serves as light yellowish green which is the color tone of an aminium salt system compound - light green when kneading addition of the aminium salt system compound is carried out and there is no reactivity of a binder resin and an aminium salt system compound in a binder resin, when a binder resin and an aminium salt system compound react, the kneading object serves as a color tone of dark reddish-brown - dark brown.

[0147] This phenomenon was used, melting addition of the aminium salt system compound was carried out in advance of toner manufacture to mixture with the resin and/or right electrification control agent which carry out plus electrification nature the inside of the binder resin containing an acid functional group, and the reactivity of a binder resin and an aminium salt system compound was investigated. The result is described in Table 1. Moreover, the manufactured toner was developer-ized combining the Mn-Zn system ferrite carrier which gave the methyl methacrylate coat, was carried in F6718K printer (made in Fujitsu), and investigated the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment. The result is described in Table 2. In addition, the criteria of the notation of Table 2 made x the thing of O and the fixing nature not more than it for what showed O and 90% - 80% of rates of fixing for what showed the outstanding fixing nature of 95% or more (tape friction test) of rates of fixing. Moreover, after exposing a developer to the environment under 35 degrees C and 80%RH about the electrification capacity in a high-humidity/temperature environment for 12 hours, the thing of O and the electrification recovery factor not more than it was made into x for what showed O and 70 - 80% of electrification recovery for what performed development counter stirring for 3 minutes under this environment, and showed 80% or more of electrification recovery of the amount of electrifications in an ordinary temperature normal-relative-humidity state by stirring for 3 minutes.

[0148] [Example 15] The polyester resin of acid-number 48 mg/KOH as a binder resin 80% of a binder resin total amount A binder resin total amount uses a styrene-dimethylaminoethyl methacrylate copolymer (styrene : dimethylaminoethyl methacrylate = 66:34) 20% of the weight as a right electrification binder resin. On the other hand, Toner delta was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of the 2% addition bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt (infrared light absorbent) further.

[0149] [Example 16] As a binder resin, a terephthalic acid, the ethyleneoxide addition product of bisphenol A, The sulfonic-acid conversion polyester resin of acid-number 30 mg/KOH which makes a screw (4 hydroxyphenyl) sulfonic acid an indispensable composition monomer 80% of a binder resin total amount A binder resin total amount uses a styrene-dimethylaminoethyl methacrylate copolymer (styrene : dimethylaminoethyl methacrylate = 66.34) 20% of the weight as a right electrification binder resin. On the other hand, Toner epsilon was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt system compound further.

[0150] [Example 17] As a binder resin, the binder resin total amount used the styrene-dimethylaminoethyl methacrylate copolymer (styrene : dimethylaminoethyl methacrylate = 66:34) for the polyester resin of acid-number 48 mg/KOH 20% of the weight as a right electrification binder resin 80% of the binder resin total amount, first, both were ground after melting kneading and in particle size of about 1mm, and the resin melting kneading object was obtained. Subsequently, Toner zeta was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant in this resin melting kneading object, carrying out melting kneading of 2% and the bromine-ized phthalocyanine to it, and carrying out pulverization classification of the aminium salt system compound further at it.

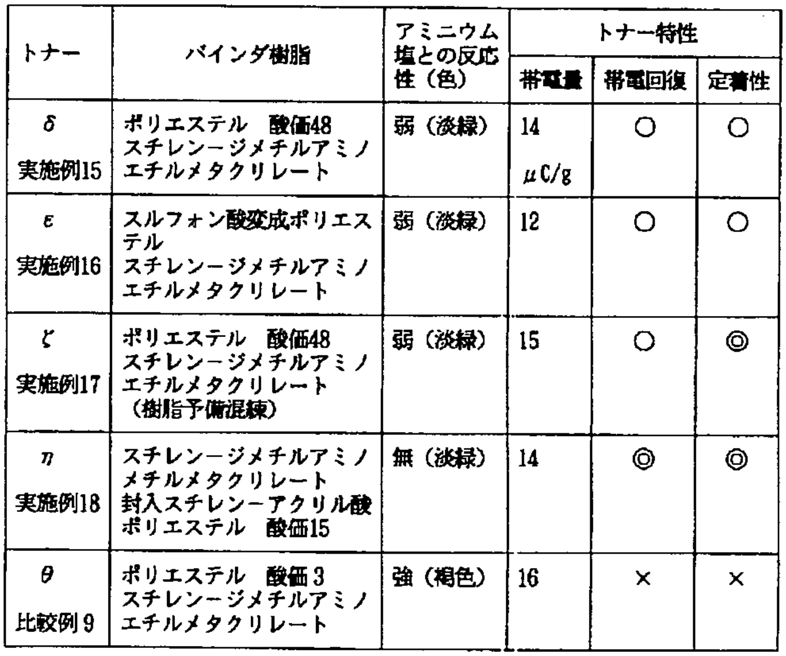
[0151] [Example 18] The styrene-acrylic-acid copolymer which enclosed the styrene-dimethylaminoethyl methacrylate copolymer particle was obtained by manufacturing the submicron particle-size particle of a styrene-dimethylaminoethyl methacrylate copolymer (styrene : dimethylaminoethyl methacrylate = 66:34) as a right electrification binder resin, and introducing this into the synthetic process of the styrene-acrylic-acid copolymer of acid-number 25 mg/KOH. In addition, the weight ratio of a styrene-dimethylaminoethyl methacrylate copolymer and a styrene-acrylic-acid copolymer was set to 50:50. Toner eta was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt system compound further, using the polyester resin of acid-number 15 mg/KOH which makes this styrene-dimethylaminoethyl methacrylate copolymer particle enclosure styrene-acrylic-acid copolymer 1 and 3 propane glycol 80% of a binder resin total amount, and makes a terephthalic acid a main composition monomer 20% of resin total amounts.

[0152] [Example 9 of comparison] The polyester resin of acid-number 3 mg/KOH as a binder resin 70% of a binder resin total amount A binder resin total amount uses a styrene-dimethylaminoethyl methacrylate copolymer (styrene : dimethylaminoethyl methacrylate = 66:34) 30% of the weight as a right electrification binder resin. On the other hand, Toner theta was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt system compound further.

[0153]

[Table 2]

表 2



トナー	バインダ樹脂	アミニウム塩との反応性（色）	トナー特性		
			帯電量	帯電回復	定着性
δ 実施例15	ポリエステル　酸価48 スチレン−ジメチルアミノエチルメタクリレート	弱（淡緑）	14 μC/g	○	○
ε 実施例16	スルフォン酸変成ポリエステル スチレン−ジメチルアミノエチルメタクリレート	弱（淡緑）	12	○	○
ζ 実施例17	ポリエステル　酸価48 スチレン−ジメチルアミノエチルメタクリレート （樹脂予備混練）	弱（淡緑）	15	○	◎
η 実施例18	スチレン−ジメチルアミノメチルメタクリレート 封入スチレン−アクリル酸 ポリエステル　酸価15	無（淡緑）	14	◎	◎
θ 比較例9	ポリエステル　酸価3 スチレン−ジメチルアミノエチルメタクリレート	強（褐色）	16	×	×

[0154] By the method as the example of a means (v) means (iv) described, the reactivity of a binder resin and an aminium salt system compound and manufactured characterization of a toner were performed. A result is shown in Table 3.

[0155] [Example 19] A binder resin total amount uses a styrene-vinyl-pyrrolidone copolymer (styrene : vinyl-pyrrolidone = 80:20) 50% of the weight as a plus electrification nature binder resin. A binder resin total amount uses the polyester resin which furthermore uses a terephthalic acid and the bisphenol A ethyleneoxide addition product as a main monomer component 50% of the weight. On the other hand, Toner iota was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt system compound further.

[0156] [Example 20] A binder resin total amount uses a methyl methacrylate-vinyl pyrimidine copolymer (methyl methacrylate : vinyl pyrimidine = 85:15) 30% of the weight as a plus electrification nature binder resin. A binder resin total amount uses the polyester resin which furthermore uses a terephthalic acid and the bisphenol A ethyleneoxide addition product as a main monomer component 70% of the weight. On the other hand, Toner kappa was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt system compound further.

[0157] [Example 21] A binder resin total amount uses a methyl methacrylate-dimethyl acrylamide copolymer (methyl methacrylate : dimethyl acrylamide = 80:20) 40% of the weight as a plus electrification nature binder resin. A binder resin total amount uses the polyester resin which furthermore uses a terephthalic acid and the bisphenol A ethyleneoxide addition product as a main monomer component 60% of the weight. On the other hand, Toner lambda was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt system compound further.

[0158] [Example 22] The amide denaturation polyester (amine monomer 15mol %) which made the amine react to the carboxylic acid of polyester as a plus electrification nature binder resin was used, and Toner mu was obtained to this by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out pulverization classification of the aminium salt system compound further.

[0159] [Example 23] Made the isocyanate react to the hydroxyl group of the polyester resin which uses a terephthalic acid and the bisphenol A ethyleneoxide addition product as an indispensable monomer component as a binder resin. Urethane conversion polyester (it is urethane closure in about 30% of an end OH basis) is used. On the other hand, Toner nu was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out trituration classification of the aminium salt system compound further.

[0160] [Example 24] A binder resin total amount uses the amine bridge formation epoxy resin which constructed the bridge in bisphenol A type epoxy, using N aminoethyl piperazine as a plus electrification nature binder resin 30% of the weight. A binder resin total amount uses the polyester resin which furthermore uses a terephthalic acid and the bisphenol A ethyleneoxide addition product as a main monomer component 70% of the weight. On the other hand, Toner xi was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out trituration classification of the aminium salt system compound further.

[0161] [Example 25] A binder resin total amount uses a propylene screw hydroxy arachin acid amide 20% of the weight as a plus electrification nature binder. A binder resin total amount uses the polyester resin which furthermore uses a terephthalic acid and the bisphenol A ethyleneoxide addition product as a main monomer component 80% of the weight. On the other hand, Toner pi was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out trituration classification of the aminium salt system compound further.

[0162] [Example 10 of comparison] A binder resin total amount uses a styrene-2-ethylhexyl acrylate copolymer (styrene : 2-ethylhexyl acrylate = 75:25) 50% of the weight as a binder resin. A binder resin total amount uses the polyester resin which furthermore uses a terephthalic acid and the bisphenol A ethyleneoxide addition product as a main monomer component 50% of the weight. On the other hand, Toner rho was obtained by adding a polypropylene wax 1% as 2% (coloring material) and a fixing assistant, carrying out melting kneading of 2% and the bromine-ized phthalocyanine, and carrying out trituration classification of the aminium salt system compound further.

[0163] [Example 11 of comparison] Toner sigma was obtained like examples 19-21 except a binder resin total amount using a styrene-dimethylaminoethyl methacrylate copolymer (styrene : dimethylaminoethyl methacrylate = 90:10) 20% of the weight as an alternative binder of the plus electrification nature binder shown in examples 19-21.

[0164] [Example 12 of comparison] Toner tau was obtained like examples 19-21 except a binder resin total amount using a styrene-methyl meta-KURIRETOJI methylacrylamide copolymer (styrene : methyl methacrylate : dimethyl acrylamide = 35:30:35) 20% of the weight as an alternative binder of the plus electrification nature binder shown in examples 19-21.

[0165] [the example 13 of comparison] -- the plus electrification nature binder shown in examples 19-21 -- not using it -- the electrification control agent (P-51:Orient chemistry) of a quarternary-ammonium-salt system -- 2wt(s)% -- Toner upsilon was obtained like examples 19-21 except having added Although an evaluation result is collectively described in Table 3, if plus electrification nature is given using the case where plus electrification nature is given to a toner using the binder which makes dimethylaminoethyl methacrylate a composition monomer as a binder, or a quarternary-ammonium-salt system electrification control agent, in response to influence, fixing nature will fall [an aminium salt] extremely.

[0166] The electrification recovery capacity at the time of after [neglect] re-stirring in the toner which, on the other hand, does not use the binder which has a plus system electrification control agent and plus electrification grant nature is bad, and there are many problems practically. In order to be compatible in these technical problems, the thermoplastics which takes the structure which the amide group shown by nitrogen ring-like structure and/or -RCONH (s)2 (R is the benzene ring or zero to carbon-number 2 aliphatic hydrocarbon), such as the imidazole ring described in this application, a pyrimidine ring, a pyrrolidone ring, a pyrazole ring, a pyrroline ring, and a pyrrole ring, has configurated in the shape of a pendant in the binder chain, specific polyester and specific epoxy, and an amide system resin are needed.

[0167]

[Table 3]

表 3

トナー	バインダ樹脂	アミニウム塩との反応性（色）	トナー特性		
			帯電量	定着性	帯電回復
ι 実施例19	スチレン－ビニルピロリドン共重合体 ポリエステル	弱（淡緑） 無（淡緑）	16 μC/g	○	◎
κ 実施例20	メチルメタアクリレート－ビニルピリミジン ポリエステル	弱（淡緑） 無（淡緑）	18	◎	○
λ 実施例21	メチルメタアクリレート－ジメチルアクリルアミド ポリエステル	弱（淡緑） 無（淡緑）	18	◎	◎
μ 実施例22	アミン変成ポリエステル	弱（淡緑）	15	○	○
ν 実施例23	ウレタン変成ポリエステル	無（淡緑）	14	○	○
ξ 実施例24	アミン架橋エポキシ ポリエステル	弱（淡緑） 無（淡緑）	16	◎	○
π 実施例25	プロピレンビスヒドロキシアラキン酸アミド ポリエステル	無（淡緑） 無（淡緑）	14	◎	○
ρ 比較例9	スチレン－2エチルヘキシルアクリレート ポリエステル	中（濃緑） 無（淡緑）	12	○	×
C 比較例1	ポリエステル	無（淡緑）	10	◎	×
σ 比較例11	スチレン－ジメチルアミノエチルメタクリレート ポリエステル	強（褐色） 無（淡緑）	16	×	×
τ 比較例12	スチレン－メチルメタアクリレート－ジメチルアクリルアミド ポリエステル	中（濃緑） 無（淡緑）	14	×	○
υ 比較例13	ポリエステル 4級アンモニウム塩（帯電制御剤）	無（淡緑） 強（褐色）	18	×	×

[0168] 1%, a bromine-ized phthalocyanine is added as a coloring material, a polypropylene wax is further, added 1% as a fixing assistant 2%, and melting kneading of the quarternary ammonium salt which has the same anion for the aminium salt system compound which makes a hexafluoro antimonic acid an anion to this 2% using the polyester resin which uses the ethyleneoxide addition product of bisphenol A as a main diol component, and uses a terephthalic acid as a main dicarboxylic-acid component as a means (vi) [example 26] binder resin is carried out. Subsequently, Toner phi was obtained by carrying out pulverization classification.

[0169] This toner phi was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 85% of rates of fixing (tape friction test) was shown. Moreover, after being exposed to the environment under 35 degrees C of developers, and 80%RH about electrification capacity for 12 hours, when development counter stirring was performed for 3 minutes under this environment, it is stirring for 3 minutes and the electrification recovery to about 80% of the amount of electrifications in an ordinary temperature normal-relative-humidity state being shown, and having the outstanding electrification capacity was checked.

[0170] [Example 27] Molybdate system quarternary ammonium salt is added for quarternary ammonium salt 3%, a polypropylene wax is further added for a bromine-ized phthalocyanine 1% 2% 0.2% 1%, and melting kneading of the aminium salt system compound which makes a common anion perchloric acid using the same binder resin as an example 26 is carried out. Subsequently, Toner chi was obtained by carrying out trituration classification.

[0171] By the same method of showing this toner chi in an example 26, when fixing nature and electrification capacity were investigated, the outstanding property of 90% of rates of fixing and 90% of electrification recovery factors was acquired.

[0172] As a means (vii) [example 28] binder resin, the ethyleneoxide of bisphenol A A main diol component, The polyester resin which uses a terephthalic acid as a main dicarboxylic-acid component is used. The compound of the structure expression (1) which makes perchloric acid an anion On the other hand, 1.5wt(s)%, The compound of the structure expression (2) which furthermore makes perchloric acid an anion by adding Quinacridone system red pigments as a coloring material 0.5wt(s)%, adding a polypropylene wax 1% as a fixing assistant 2.5wt(s)%, and carrying out pulverization classification after melting kneading The toner psi which has a red color tone with high saturation was obtained.

[0173] This toner psi was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 85% of rates of fixing (tape friction test) was shown. Moreover, after being exposed to the environment under 35 degrees C of developers, and 80%RH about electrification capacity for 12 hours, when development counter stirring was performed for 3 minutes under this environment, it is stirring for 3 minutes and the electrification recovery to about 80% of the amount of electrifications in an ordinary temperature normal-relative-humidity state being shown, and having the outstanding electrification capacity was checked.

[0174] [Example 29] The ethyleneoxide of bisphenol A as a binder resin Main diol component, The polyester resin which uses a terephthalic acid as a main dicarboxylic-acid component is used. The compound of the structure expression (1) which makes perchloric acid an anion On the other hand, 1.5wt(s)%, The compound of the structure expression (1) which furthermore makes a hexafluoro antimonic acid an anion 0.5wt(s)%, Quinacridone system red pigments were added as a coloring material, the polypropylene wax was added 1% as a fixing assistant 2.5wt(s)%, and the toner omega which has a red color tone with high saturation by carrying out trituration classification after melting kneading was obtained.

[0175] This toner omega was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 85% of rates of fixing (tape friction test) was shown. Moreover, about 80% of electrification recovery factor being shown about electrification capacity, and having the outstanding electrification capacity was checked.

[0176] [Example 14 of comparison] The ethyleneoxide of bisphenol A as a binder resin Main diol component, The polyester resin which uses a terephthalic acid as a main dicarboxylic-acid component is used. The compound of the structure expression (1) which makes perchloric acid an anion On the other hand, 2.0wt(s)%, Quinacridone system red pigments were added as a coloring material, the polypropylene wax was added 1% as a fixing assistant 2.5wt(s)%, and the toner a which has a red color tone with high saturation by carrying out pulverization classification after melting kneading was obtained.

[0177] This toner a was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 85% of rates of fixing (tape friction test) was shown. However, it turns out that it remains in an electrification recovery factor about 50% about electrification capacity, and a problem is in electrification capacity.

[0178] [Example 15 of comparison] Toner b was obtained by adding Quinacridone system red pigments as a coloring material 2.0wt(s)%, adding a polypropylene wax 1% as a fixing assistant 2.5wt(s)%, and carrying out pulverization classification of the compound of the structure expression (2) which makes perchloric acid an anion to this as a binder resin using the polyester resin which uses the ethyleneoxide of bisphenol A as a main diol component, and uses a terephthalic acid as a main dicarboxylic-acid component after melting kneading. The color tone of this toner b was dark reddish-brown, and was not suitable as a red system toner (color quality deteriorated).

[0179] As a means (viii) [example 30] binder resin, the ethyleneoxide of bisphenol A A main diol component, The polyester resin which uses a terephthalic acid as a main dicarboxylic-acid component is used. The quarternary ammonium salt which makes a molybdic acid an anion as an electrification control agent On the other hand, 0.5wt (s)%, A polypropylene wax as a fixing assistant 2.5wt(s)% for Quinacridone system red pigments as a coloring material 1%, The aminium salt system compound which furthermore makes perchloric acid an anion as an infrared light absorbent 1.5wt(s)%, as the infrared light absorbent used together -- a screw (1, 2 dithio phenolate) nickel tetrapod n butyl ammonium salt -- 0.5wt(s)% -- it added and Toner d was obtained by carrying out pulverization classification after melting kneading

[0180] This toner d was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 85% of rates of fixing (tape friction test) was shown. Moreover, after being exposed to the environment under 35 degrees C of developers, and 80%RH about electrification capacity for 12 hours, when development counter stirring was performed for 3 minutes under this environment, it is stirring for 3 minutes and the electrification recovery to about 80% of the amount of electrifications in an ordinary temperature normal-relative-humidity state being shown, and having the outstanding electrification capacity was checked.

[0181] [Example 31] Toner e was obtained like the example 30 except using 1.0wt(s)% for a screw (1 mercapto rate 2 naphth rate) platinum tetrapod n butyl ammonium salt as an infrared light absorbent used together. This toner e was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 90% of rates of fixing (tape friction test) was shown. Moreover, an electrification recovery factor is 75% and having the outstanding electrification capacity was checked.

[0182] [Example 32] Toner f was obtained like the example 30 except using 0.5wt(s)% for a BICHIENIRI DIN screw benzoquinone as an infrared light absorbent used together. This toner f was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 90% of rates of fixing (tape friction test) was shown. Moreover, an electrification recovery factor is 85% and having the outstanding electrification capacity was checked.

[0183] [Example 33] Toner g was obtained like the example 30 except using 0.3wt(s)% for a vanadyl OKISHIHEKISA decamethyl phthalocyanine as an infrared light absorbent used together. This toner was developer-ized combining the ferrite carrier, it carried in F6718K printer (made in Fujitsu), and the electrification capacity in flash plate fixing nature and a high-humidity/temperature environment was investigated. Consequently, the outstanding fixing nature of 90% of rates of fixing (tape friction test) was shown. Moreover, an electrification recovery factor is 85% and having the outstanding electrification capacity was checked.

[0184] [Example 34] Toner C was obtained by the method illustrated in the example 1. To Toner C, the powder (1.5 micrometers of mean particle diameters) of a propylene screw hydroxy arachin acid amide was **(ed) outside 0.8% using the Henschel mixer, and Toner h was obtained. When the fixing nature of Toner h and electrification capacity were investigated by the same method as what was shown in the example 1, 95% of fixing nature and 90% of electrification recovery capacity were shown, and it was checked that a toner property improves further by ** outside a hydroxy amide system compound.

[0185] [Example 35] The parent toner j was obtained by adding a Nigrosine system color and carbon to this, and performing jet mill pulverization to about 10 micrometers of mean particle diameters after melting kneading using the polyester resin (melting temperature of 135 degrees C) which uses the ethyleneoxide addition product of bisphenol A as a main diol component as a binder resin, and uses a terephthalic acid as a main dicarboxylic-acid component. To this parent toner j, the powder (1.5 micrometers of mean particle diameters) of a propylene screw hydroxy arachin acid amide was **(ed) outside using the 0.5wt% Henschel mixer, and Toner l was obtained.

[0186] This toner l was developer-ized combining the ferrite carrier, it carried in F6700 printer (made in Fujitsu), and change of the flash plate fixing nature of a toner, a blocking-proof property, the toner filming property over a photograph contest drum, and the printing property in a long-term running examination was investigated. Consequently, even if it left it by 60-degree-C environment for 24 hours, it did not generate and blocking showed the outstanding fixing nature of 90% of rates of flash plate fixing (tape friction test). Furthermore, after continuation printing of 1 million sheets did not generate toner filming over a photograph contest drum, but maintained the printing property which was excellent over the long period of time.

[0187] [an example 36] -- the amide oligomer powder (weight-average-molecular-weight 2000, 1 micrometer of mean particle diameters) Henschel mixer which makes a malic acid and a methylene diamine an indispensable composition monomer to the same parent toner j as an example 34 -- using -- 1.0wt(s)% -- it **(ed) outside and Toner m was obtained This toner m was developer-ized combining the ferrite carrier, it carried in made in F6700 printer; Fujitsu, and the flash plate fixing nature of a toner, the blocking-proof property, the toner filming property over a photograph contest drum, and the printing property in a long-term running examination were investigated.

[0188] Consequently, even if it left it by 60-degree-C environment for 24 hours, it did not generate and blocking showed the outstanding fixing nature of 85% of rates of flash plate fixing (tape friction test). Furthermore, after 1 million sheet continuation printing did not occur, but, as for toner filming over a photograph contest drum, maintained the printing property over the long period of time.

[0189] [Example of reference] Except not **(ing) the powder of a propylene screw hydroxy arachin acid amide outside, it was made equivalent to an example 34 and change of the flash plate fixing nature of a toner, a blocking-proof property, the toner filming property over a photograph contest drum, and the printing property in a long-term running examination was investigated.

[0190] Consequently, even if it left it by 60-degree-C environment for 24 hours, blocking was low at 60% (tape friction test) of rates of flash plate fixing, although it did not generate.

[0191]

[Effect of the Invention] According to this invention, in the color toner for flash plate fixing, the color in a light field uses a light (the color tone of a coloring material is not blocked) aminium salt system infrared light absorbent with efficient infrared light absorptance. And although the straight polarity electrification control agent which generally reacts with an aminium salt system infrared light absorbent, and checks the optical-absorption capacity is used Since the reaction between this infrared light absorbent and a straight polarity electrification control agent was considered as prevention or the composition suppressed or complemented physically or chemically, the effect which can make satisfactory the color tones of the color toner for flash plate fixing, electrification properties, and all the flash plate fixing nature is acquired.

[Translation done.]

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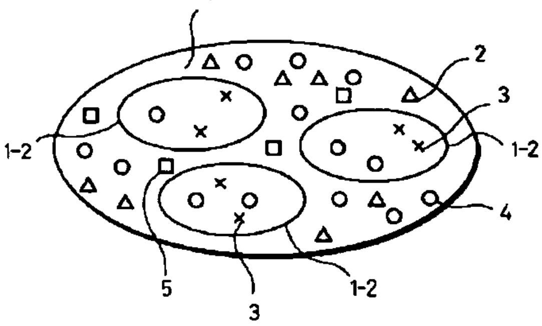
DRAWINGS

[Drawing 1]



1 -1, 1 -2, …バインダ樹脂
2 …アミニウム塩系化合物
3 …正極性帯電制御剤
4 …色剤
5 …定着助剤

[Translation done.]